

AQ Summary: PM2.5 levels are moderate to high in the D-AQ area with an hourly reading of 88 ug/m3 at Bakersfield last evening – the 2nd AQ event continues. The SJV APCD forecaster feels that levels will remain elevated until a “flush out” event at the end of the week. He expects the weak trough (passes on Tuesday night) to have a small or no impact on PM levels. There appears to be interesting structure in the observed PM2.5 levels over the last few days.

Weather Summary:

Tuesday (Flight not recommended)

SJV – SJV forecast to be socked in by cirrus throughout the day. Cirrus should recede Tuesday night. Fog similar to today also forecast to be present during the morning.

PODEX (SF and LA) – Stratus and cirrus clouds remain offshore.

Wednesday (Could be a good D-AQ flight day, the last for the near future.)

SJV – Region forecast to be cloud-free as a shortwave ridge builds into central CA.

PODEX (SF) – Models forecast a cloud-free pocket extending from SF to LA regions. However, NWS Oxnard forecaster indicated that cirrus will remain, and become a denser layer in the western study region, while marine stratus deck will remain close to the coast. NWS Monterey indicated a pocket clear of stratus and cirrus from 35-36.5N, and extending west.

Thursday until end of week










SJV – A strong trough will move into the region during Thursday, and will be situated over central CA by Friday. This will bring clouds beginning on Thursday, and a good chance of precipitation on Friday. Clouds likely to continue into Saturday.

DISCOVER-AQ / PODEX Forecast Briefing










February 4, 2013

Clare Flynn
Bryan Duncan










Fresno

TODAY	TONIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY
								
Sunny High: 66 °F	Mostly Clear Low: 43 °F	Sunny High: 64 °F	Mostly Clear Low: 42 °F	Sunny High: 62 °F	Partly Cloudy Low: 41 °F	Partly Sunny High: 58 °F	Chance Rain Low: 40 °F	Chance Showers High: 51 °F










Bakersfield

TODAY	TONIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY
								
Sunny High: 65 °F	Mostly Clear Low: 44 °F	Sunny High: 64 °F	Mostly Clear Low: 42 °F	Sunny High: 61 °F	Partly Cloudy Low: 40 °F	Mostly Sunny High: 59 °F	Chance Rain Low: 42 °F	Chance Showers High: 48 °F










San Nicolas

Today	Tonight	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday
								
WNW 15kt < 1ft	WNW 15kt < 1ft	NW 15kt < 1ft	NW 15kt < 1ft	NW 15kt < 1ft	NW 15kt < 1ft	NW 20kt < 1ft	WNW 25kt < 1ft	NW 30kt < 1ft

Monterey

TODAY	TONIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY
								
Sunny High: 52 °F	Increasing Clouds Low: 44 °F	Decreasing Clouds High: 55 °F	Mostly Clear Low: 44 °F	Sunny High: 55 °F	Partly Cloudy Low: 46 °F	Chance Rain High: 51 °F	Chance Showers Low: 45 °F	Chance Showers High: 51 °F

Palmdale

TODAY	TONIGHT	TUESDAY	TUESDAY NIGHT	WEDNESDAY	WEDNESDAY NIGHT	THURSDAY	THURSDAY NIGHT	FRIDAY
								
Sunny High: 69 °F	Mostly Clear Low: 45 °F	Sunny High: 69 °F	Mostly Clear Low: 42 °F	Sunny High: 64 °F	Partly Cloudy Low: 42 °F	Partly Sunny High: 60 °F	Chance Rain Low: 42 °F	Chance Showers High: 50 °F

Current Conditions

DENSE FOG ADVISORY until 10am PST

5 MILES NNW BAKERSFIELD CA



Fog
48°F
9°C

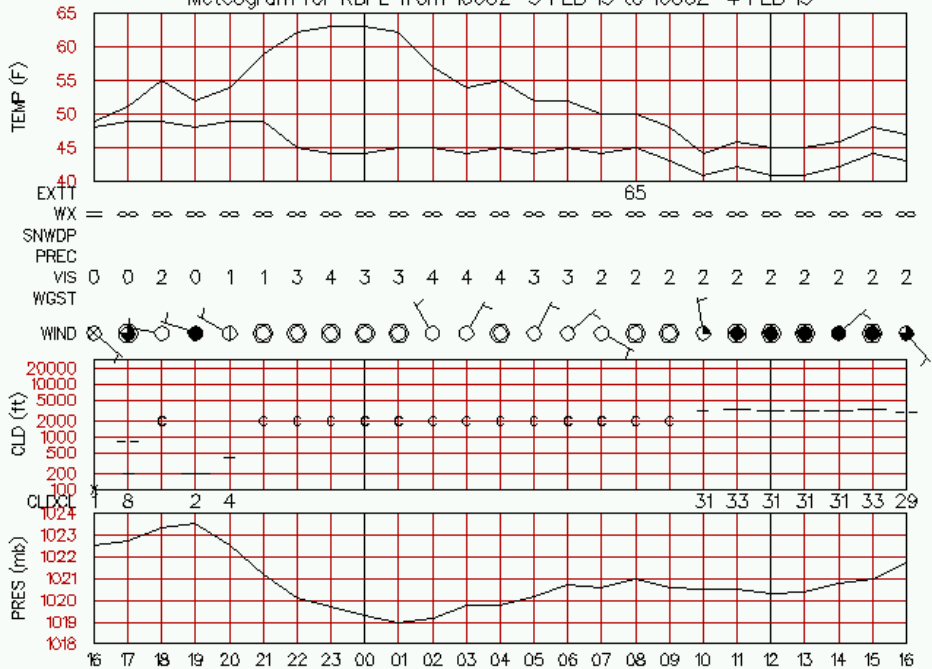
Humidity 87%
Wind Speed SE 6 MPH
Barometer 30.18 in
Dewpoint 45°F (7°C)
Visibility 1.75 mi
Wind Chill 45°F (7°C)
Last Update on 04 Feb 8:35 am PST

HANFORD

Fog

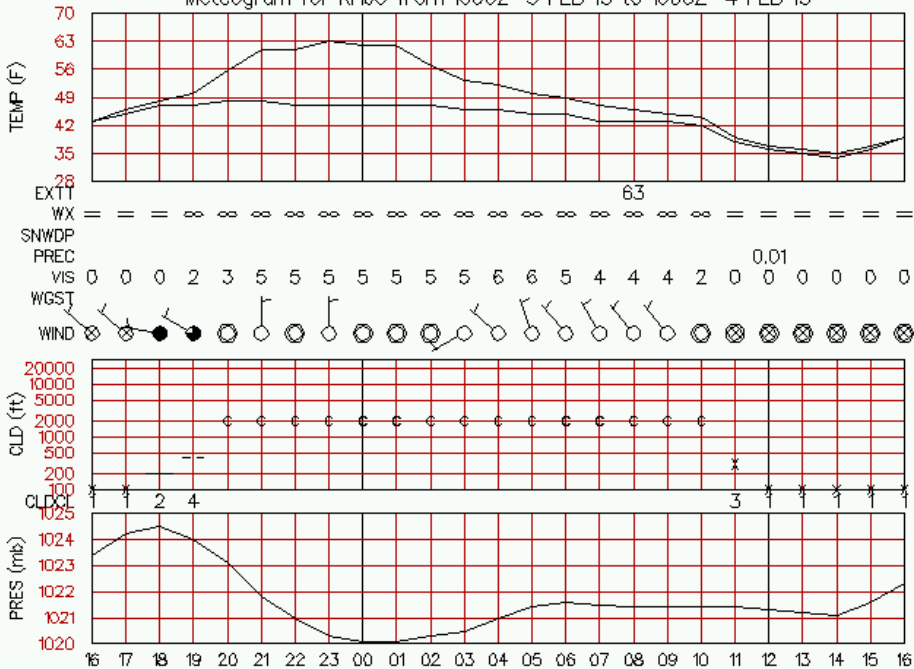
▼ Plymouth State Weather Center ▼

Meteogram for KBFL from 1600Z 3 FEB 13 to 1600Z 4 FEB 13



▼ Plymouth State Weather Center ▼

Meteogram for KHJ0 from 1600Z 3 FEB 13 to 1600Z 4 FEB 13



Current Conditions

FRESNO

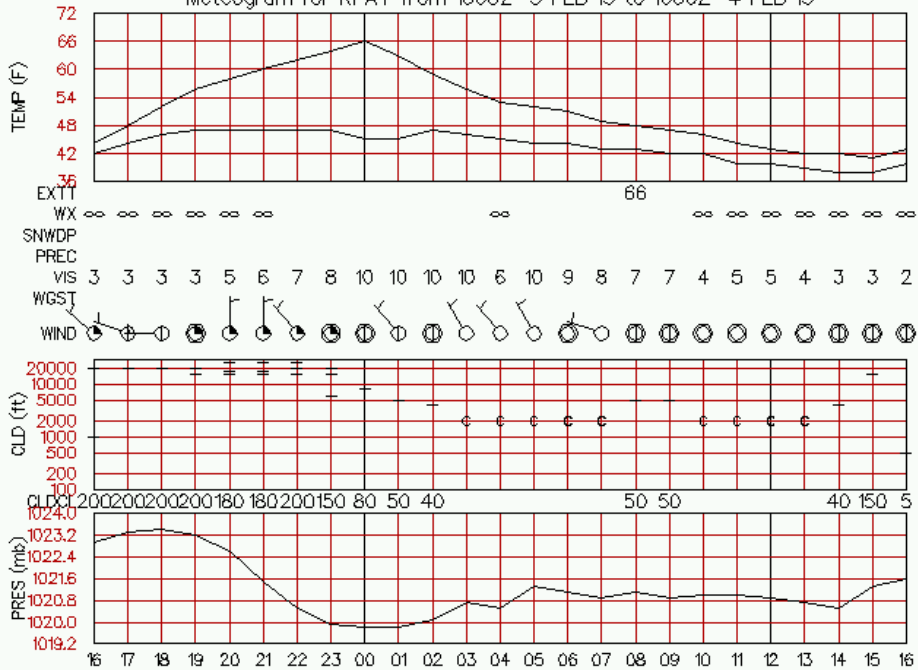


Fog
43°F
6°C

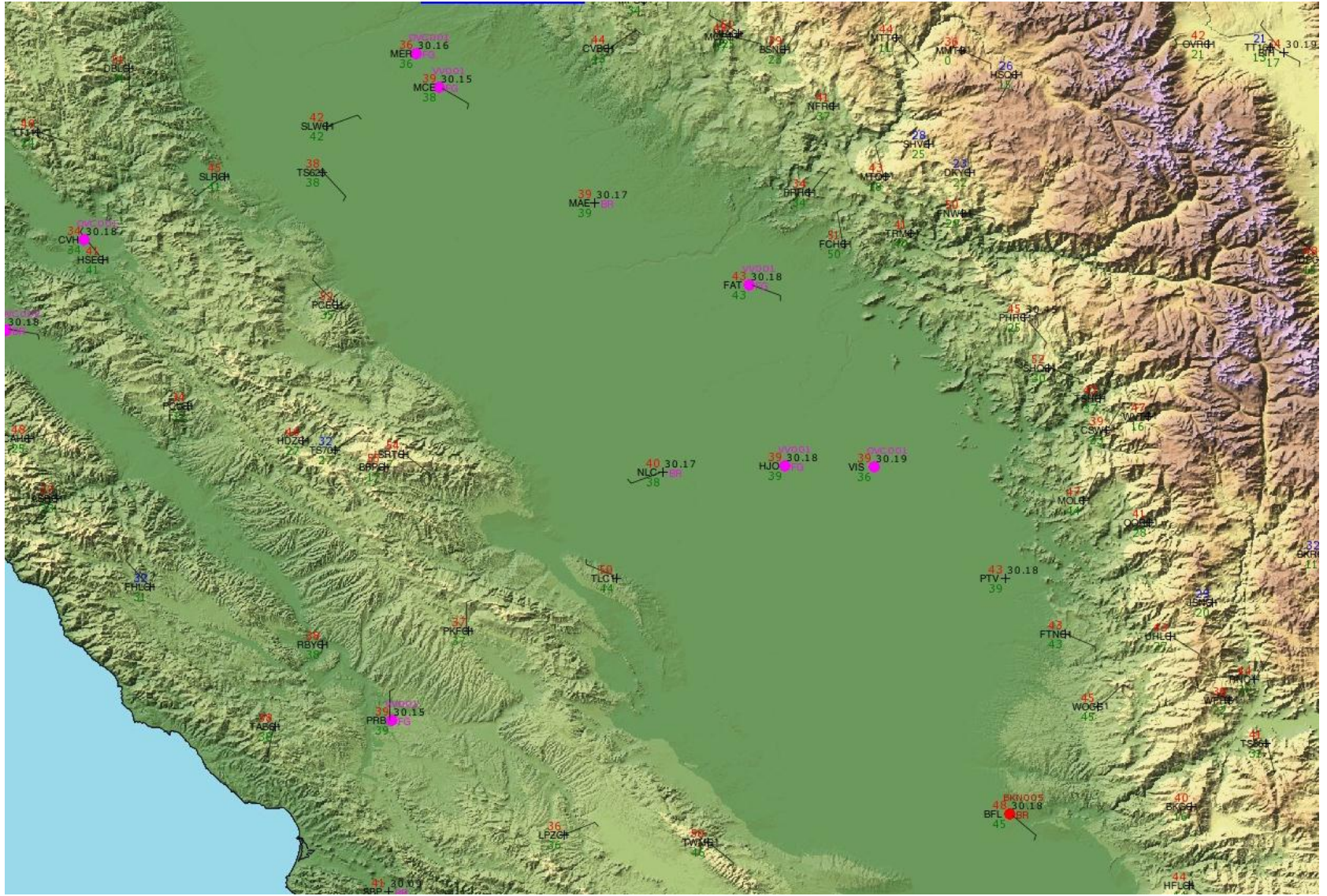
Humidity 100%
Wind Speed ESE 6 MPH
Barometer 30.18 in
Dewpoint 43°F (6°C)
Visibility 0.13 mi
Wind Chill 39°F (4°C)
Last Update on 04 Feb 8:17 am PST

▼ Plymouth State Weather Center ▼

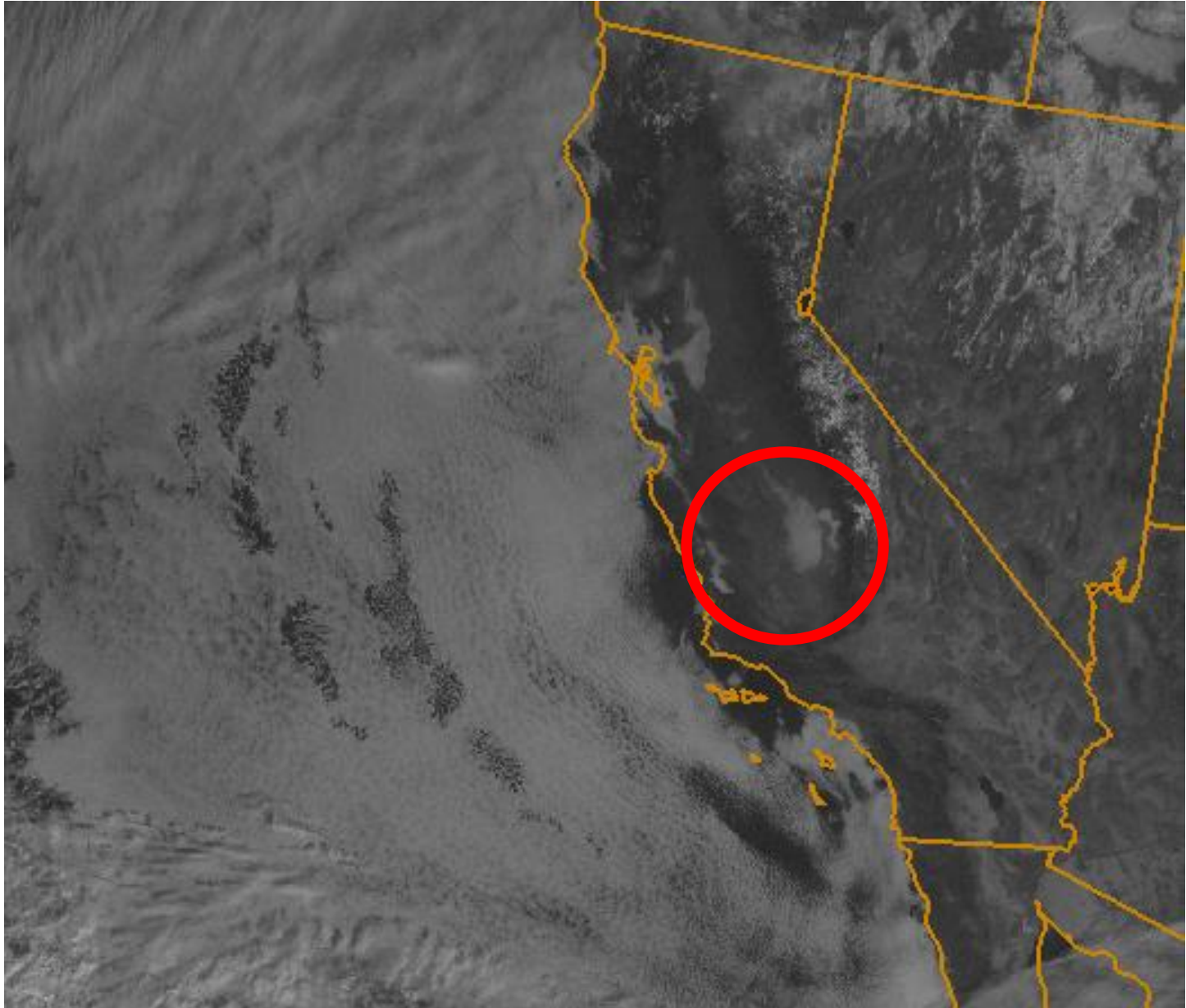
Meteogram for KFAT from 1600Z 3 FEB 13 to 1600Z 4 FEB 13



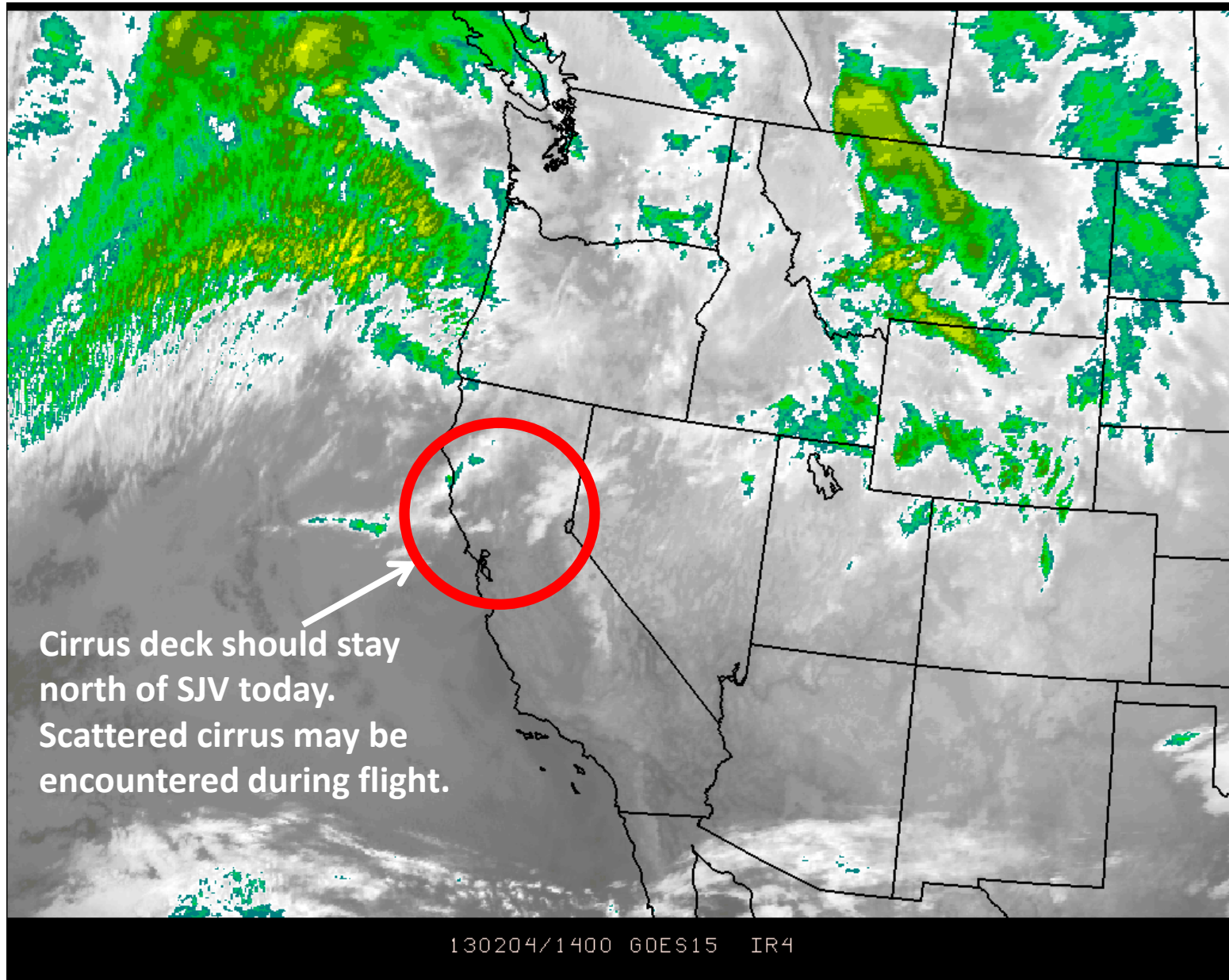
Widespread Fog: < ¼ mile visibilities



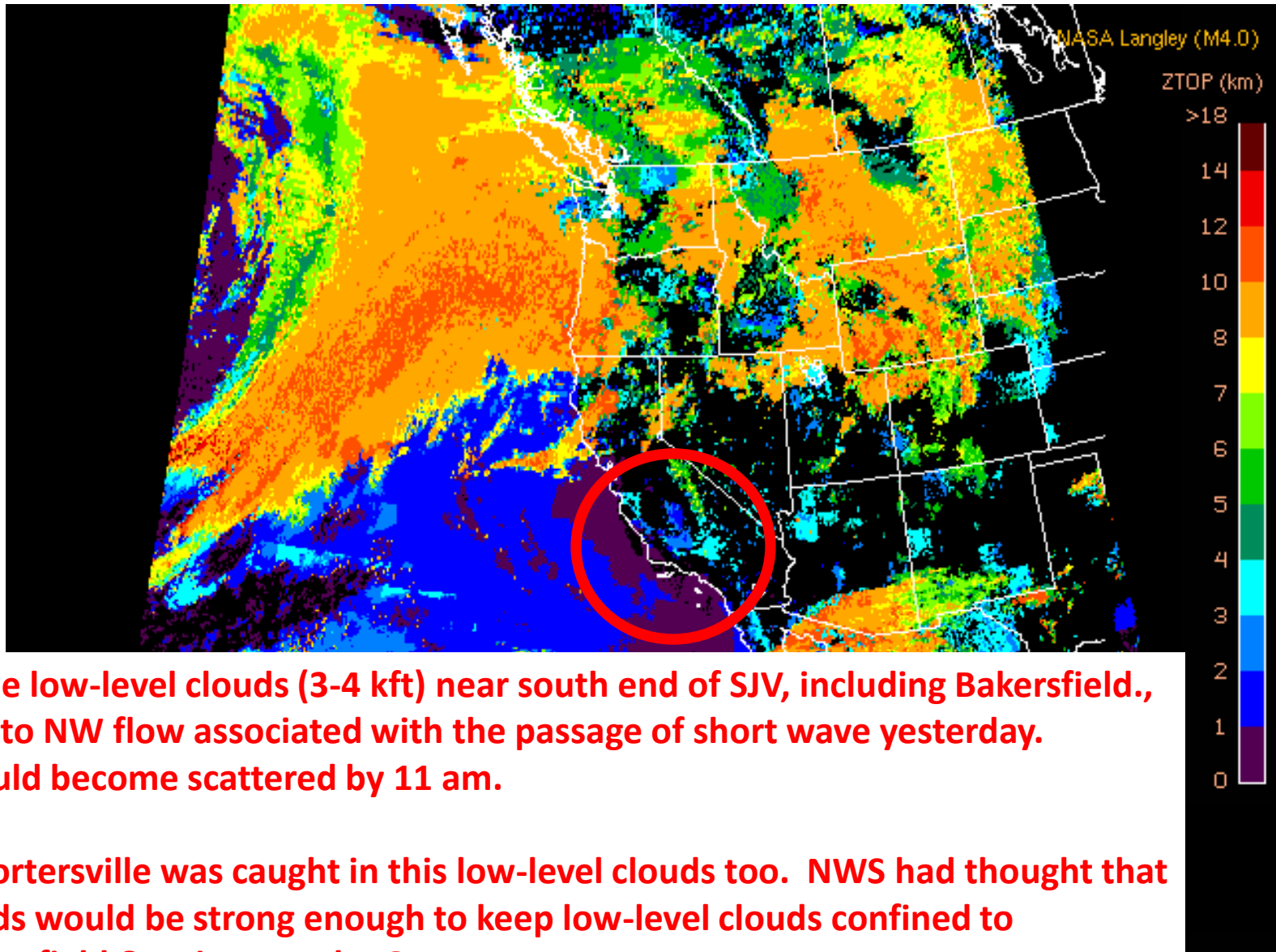
GOES Visible at 1730 (9:30 am)



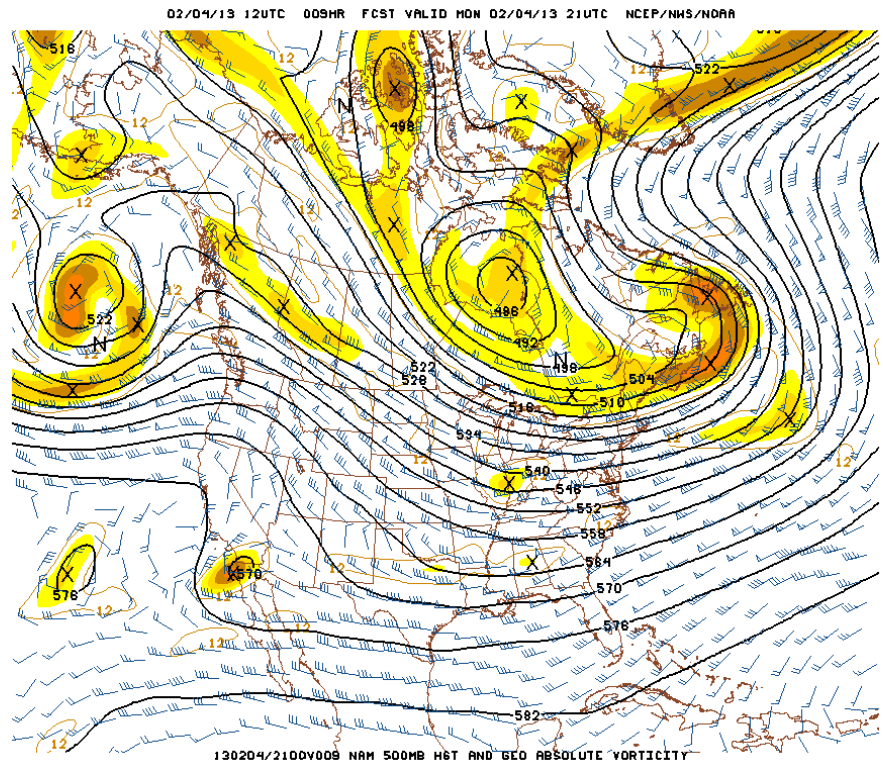
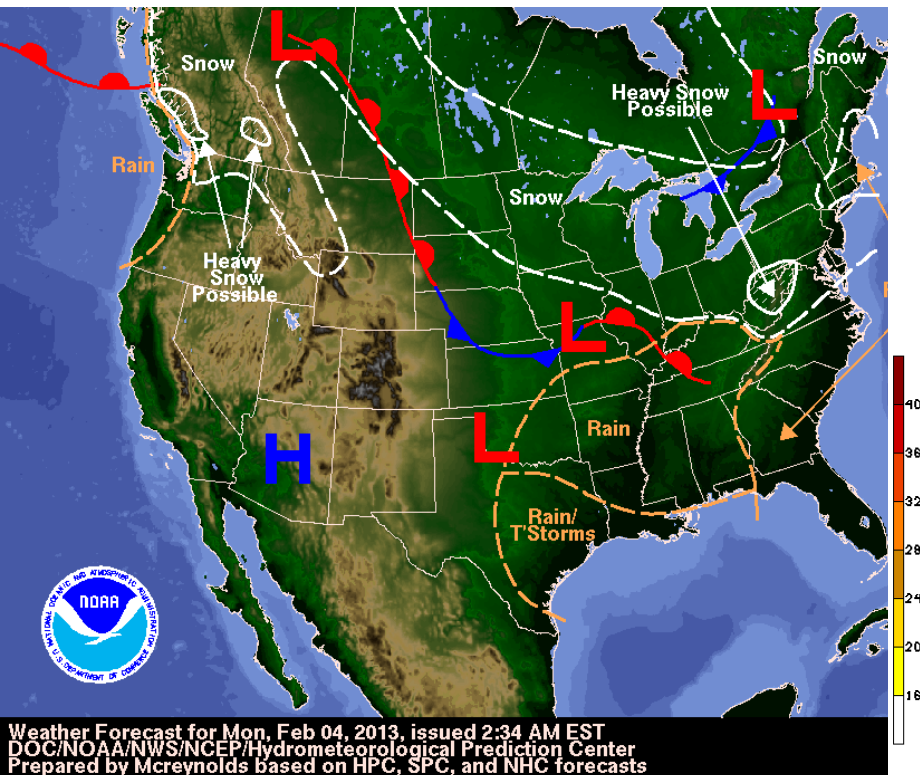
GOES: IR at 1400 UTC (6 am) Today



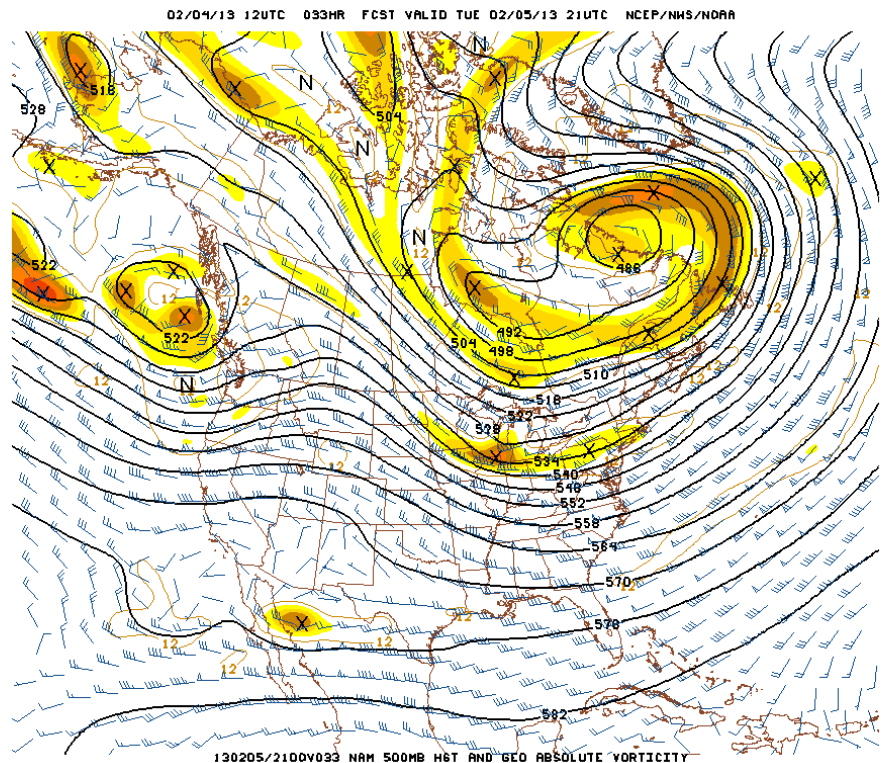
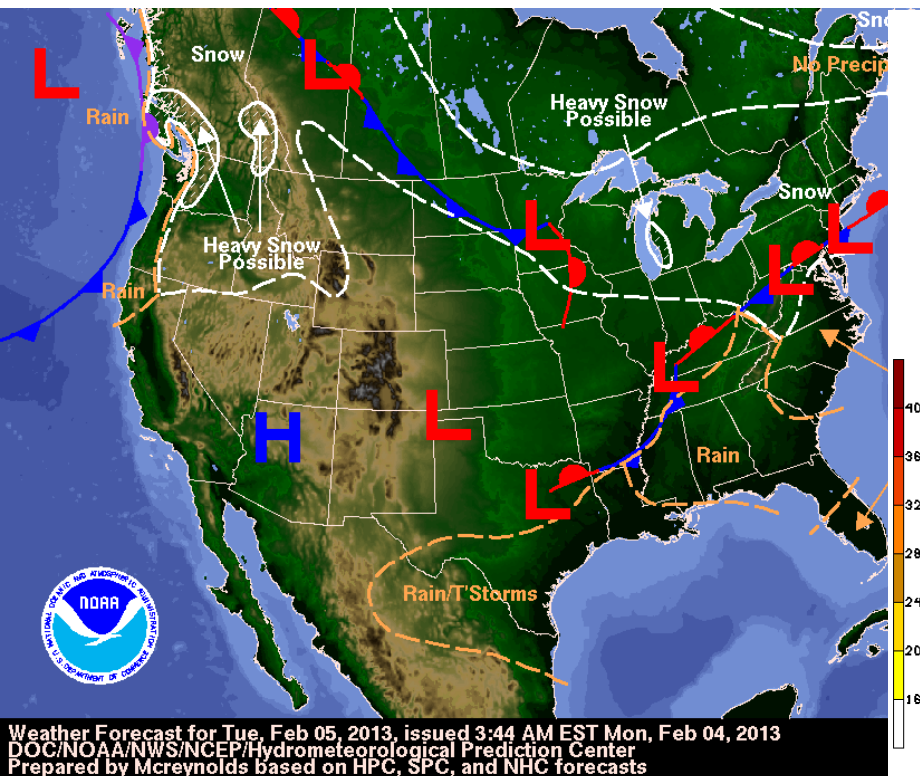
GOES: Cloud Top Height at 1430 UTC (6:30 am) Today



Today: Central CA remains under the influence of an upper ridge, leading to sunny skies and high probability of dense morning fog.

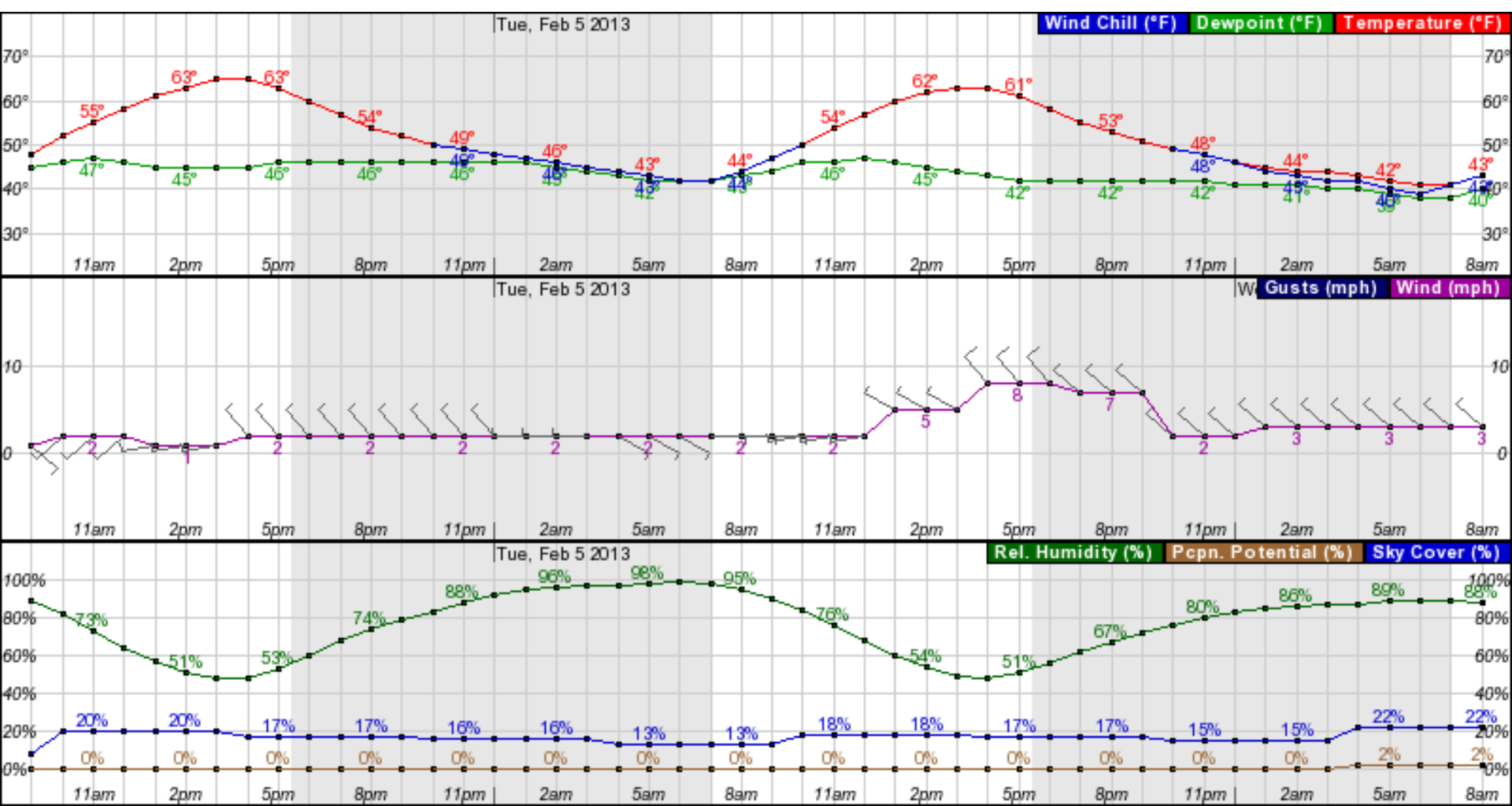


Tomorrow (Tuesday): The upper ridge continues to dominate the central CA region. However, the weak shortwave over the Pacific Northwest will send some cirrus into central CA as it moves quickly through that region.



Fresno
Today: Sunny
Tuesday: Minimal cloud cover

Today → Tuesday →



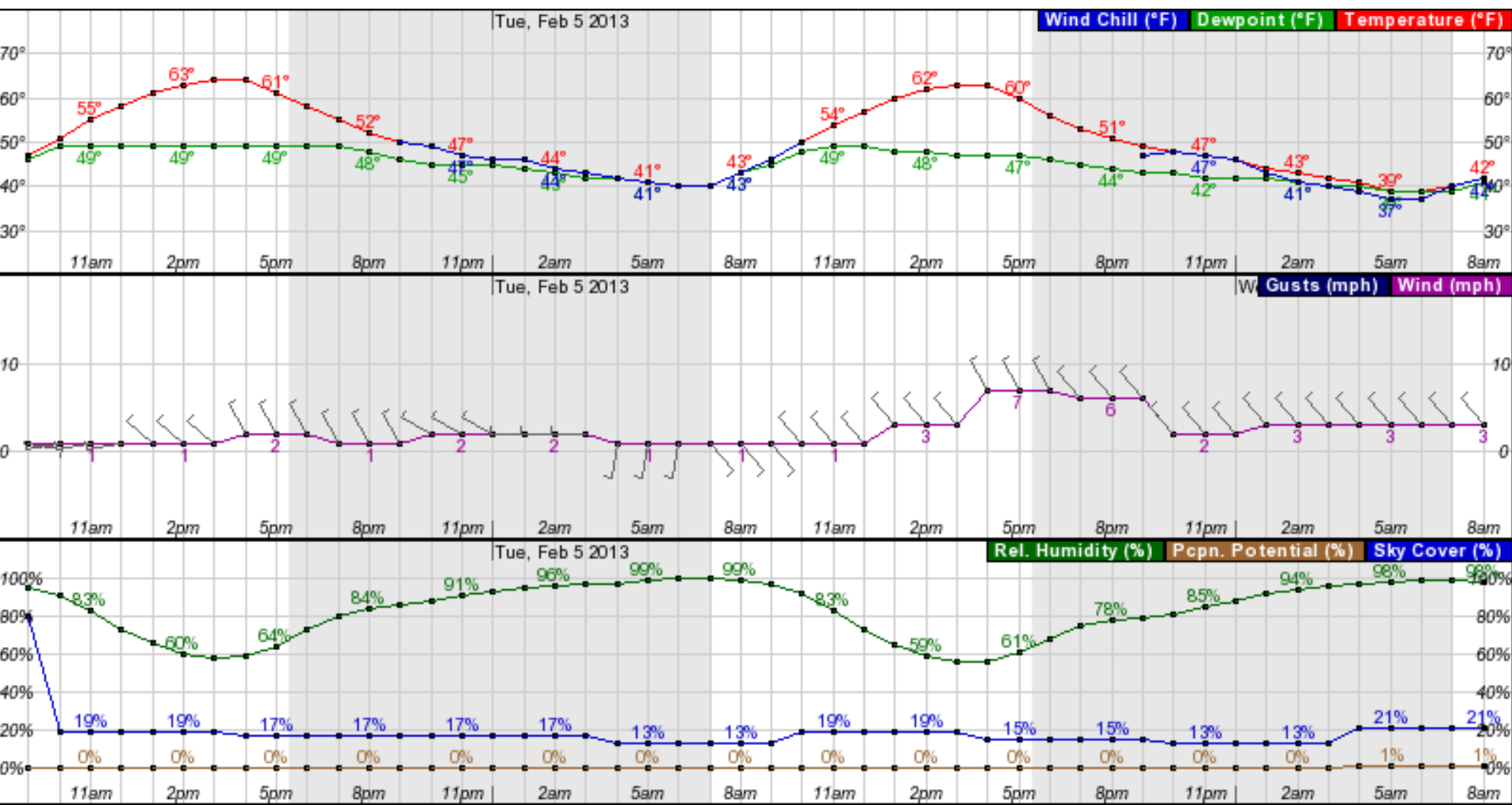
Hanford

Today: Sunny

Tuesday: Minimal cloud cover

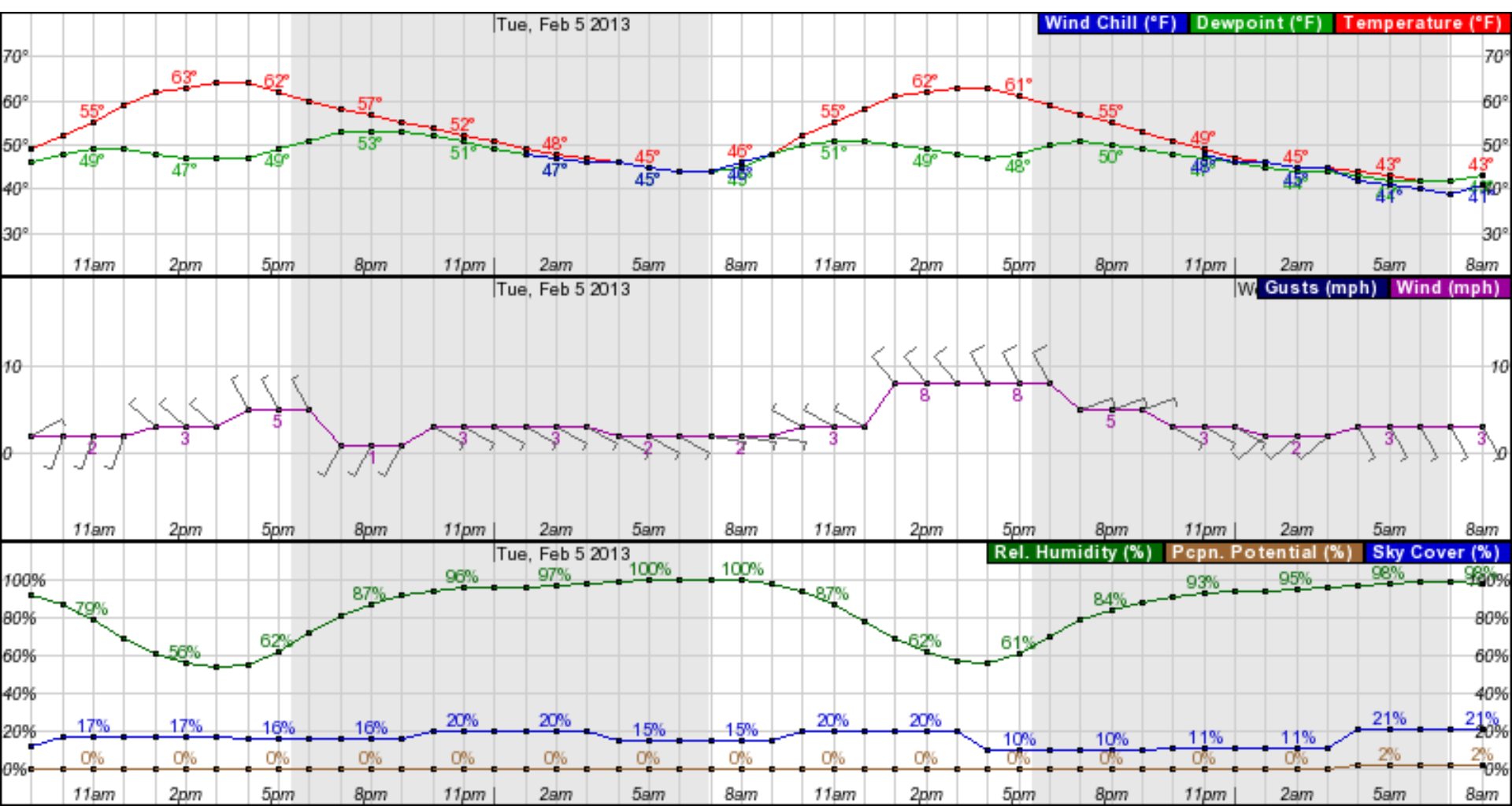
Today →

Tuesday →

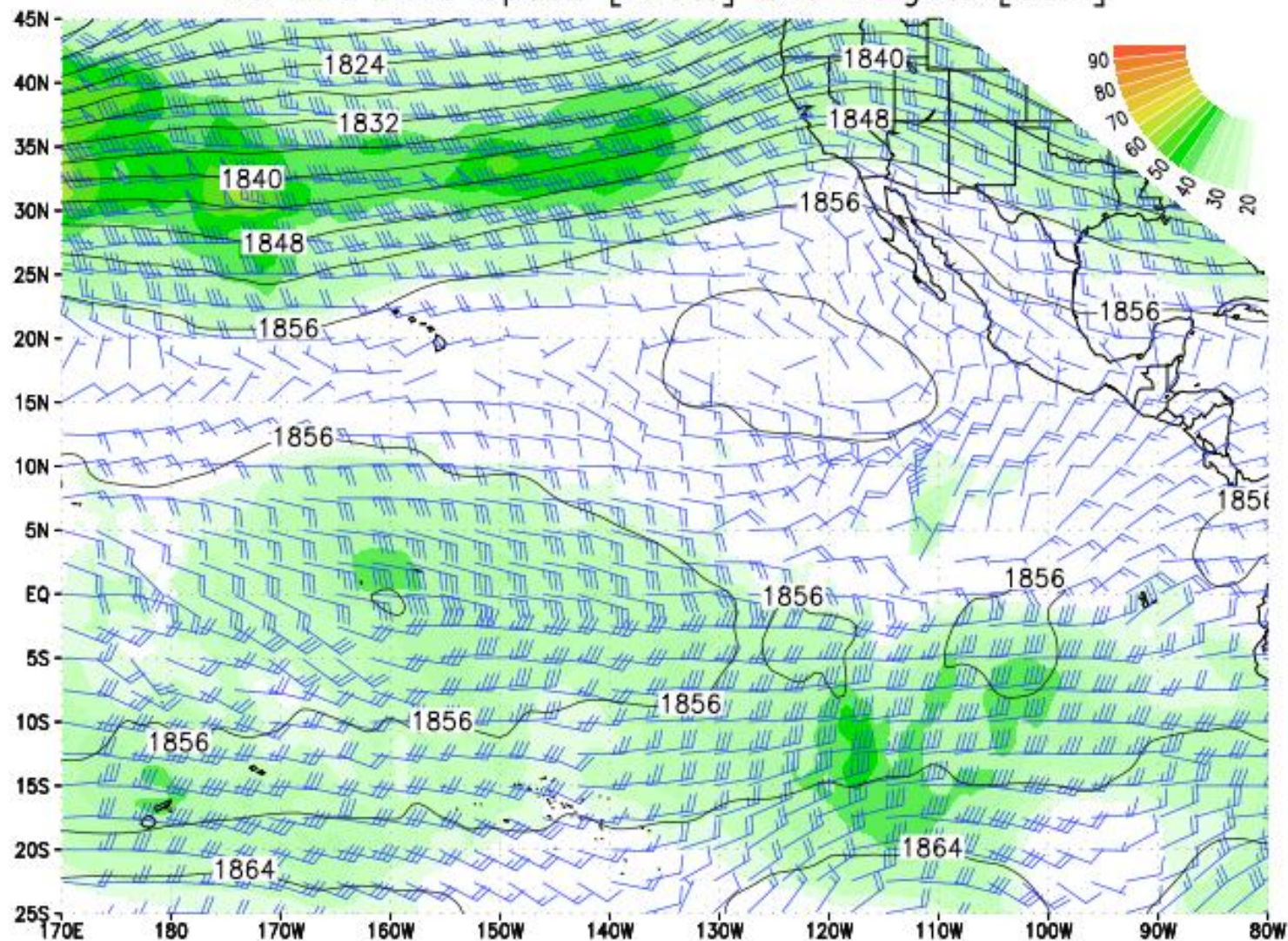


Bakersfield
Today: Sunny
Tuesday: Minimal cloud cover

Today → Tuesday →

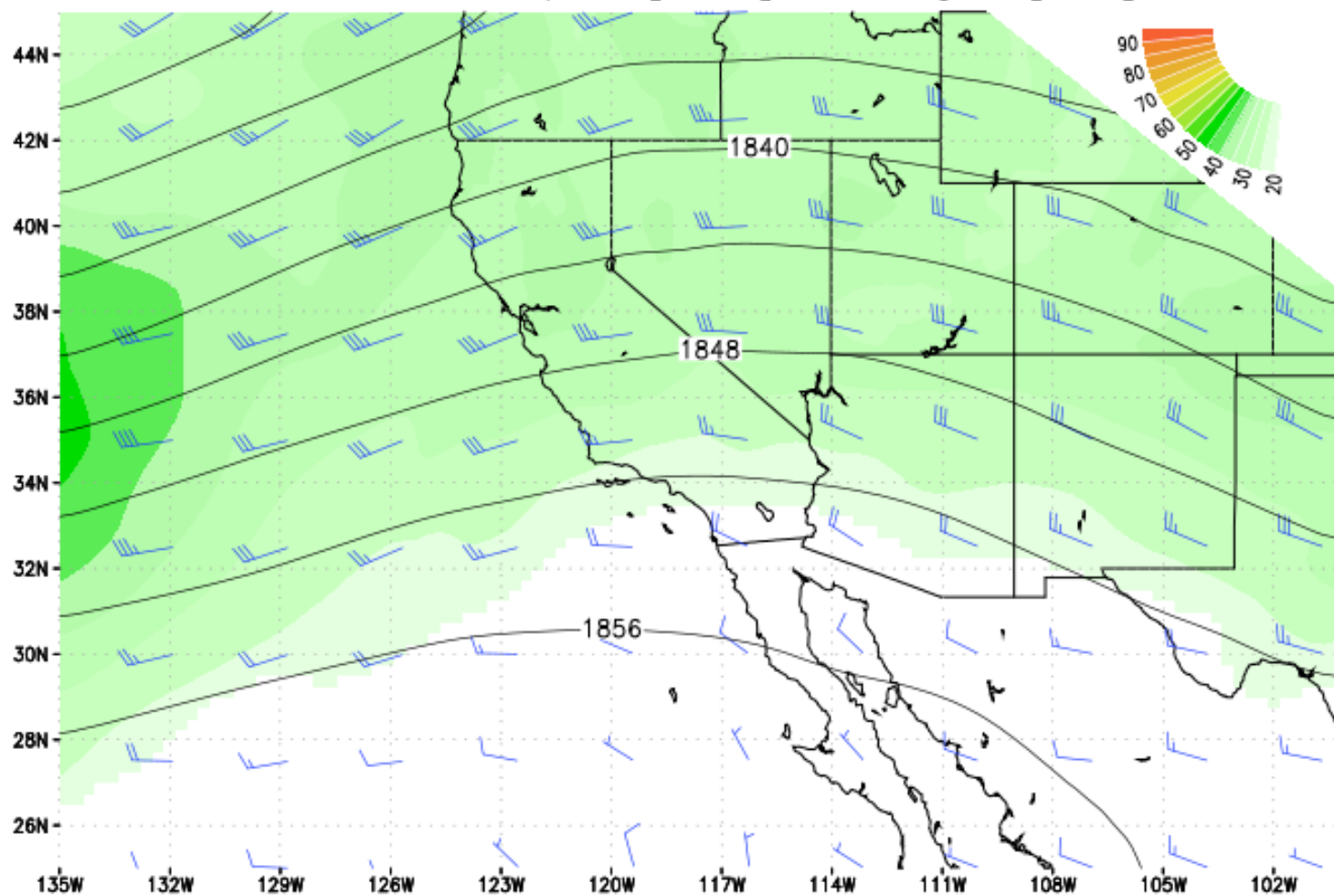


NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2013-02-04
70 hPa Wind Speed [knots] and Heights [dam]



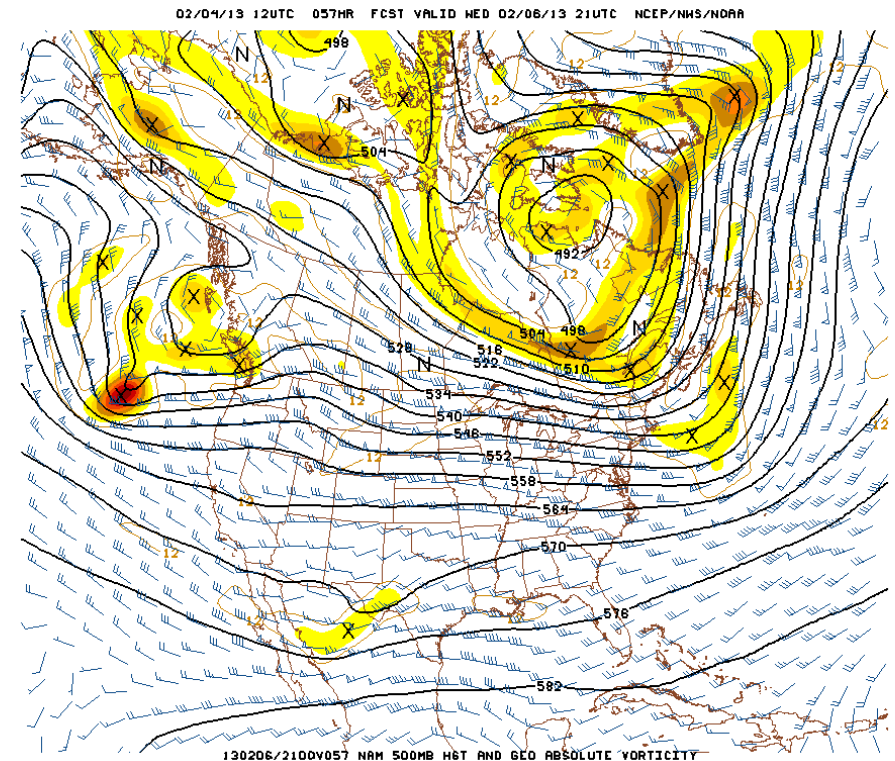
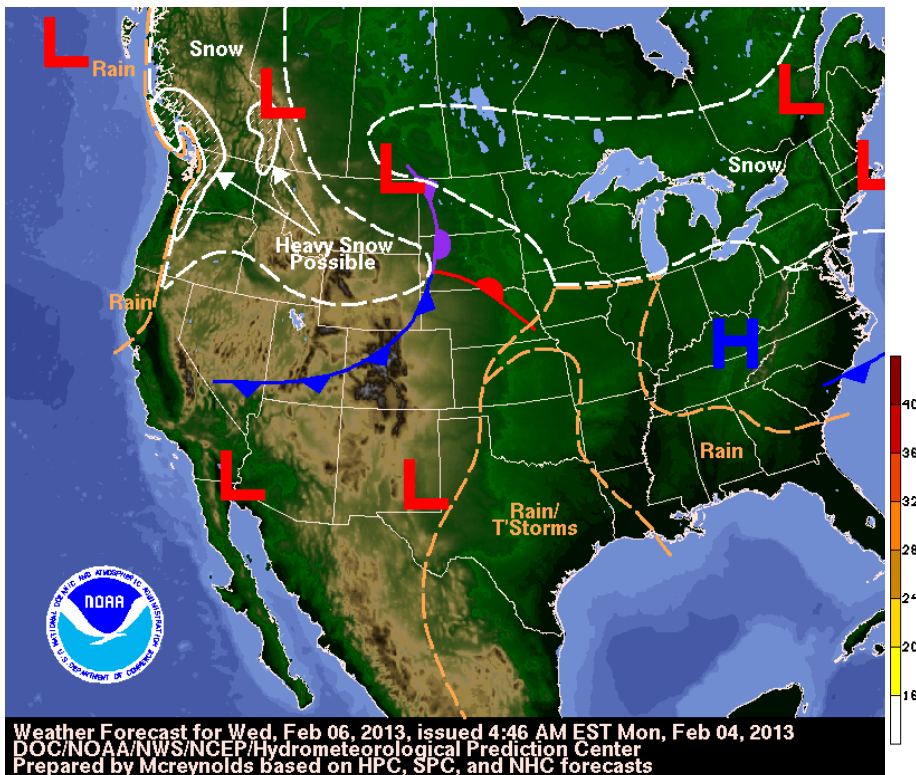
NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2013-02-04

70 hPa Wind Speed [knots] and Heights [dam]

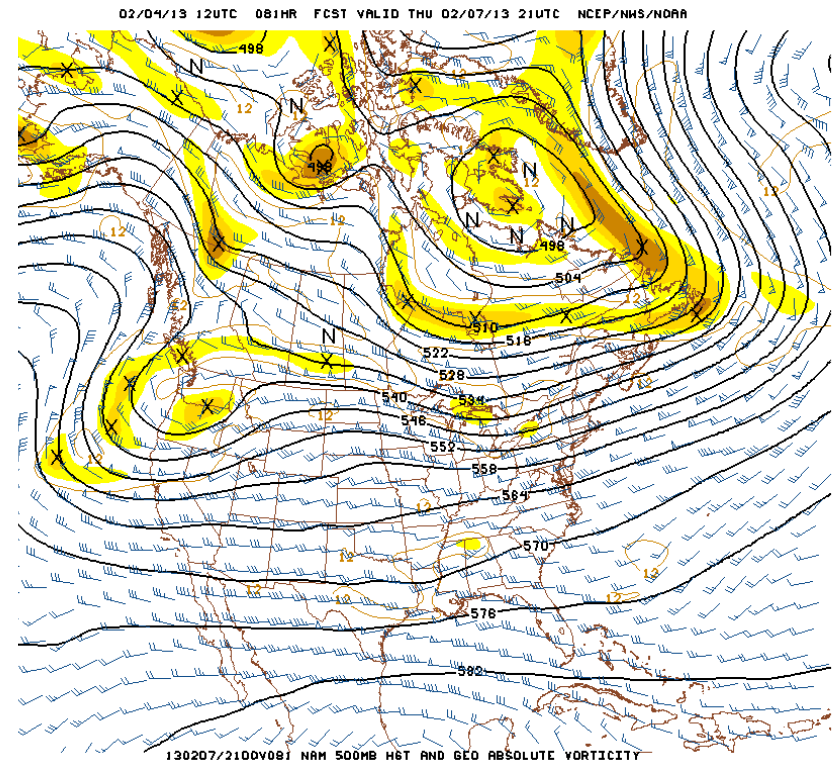
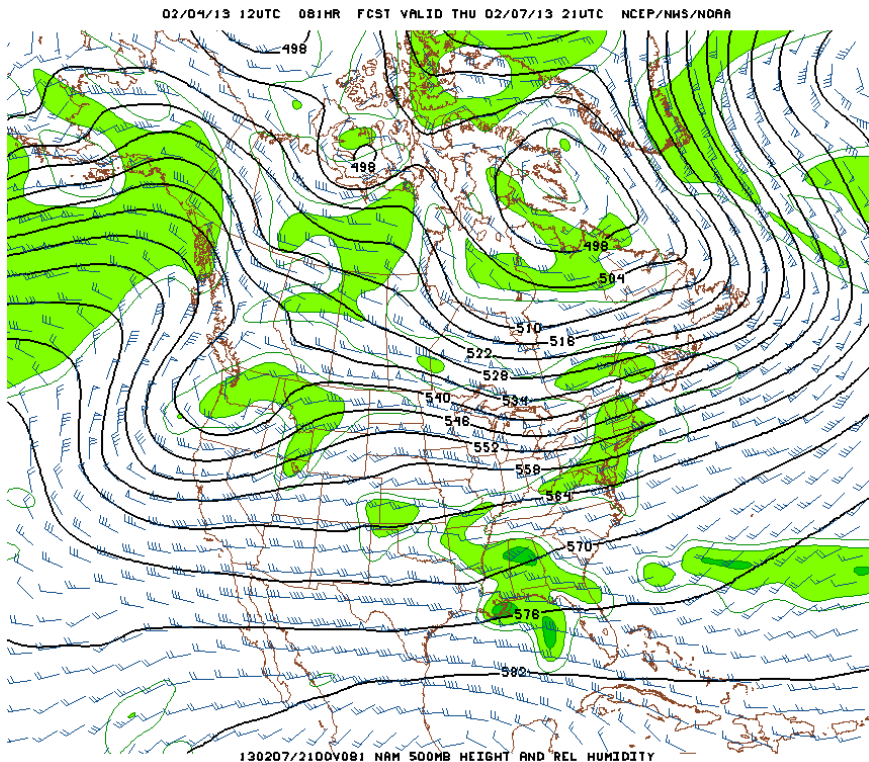


42 hr forecast valid Tue 18z 2013-02-05

Wednesday: Though weaker, upper ridge continues to dominate central CA.



Thursday: A deep and cold low pressure center begins to move over southern and central CA. NCEP and ECMWF are beginning to agree about the strength, position, and timing of the upper trough. Clouds likely and colder weather likely.

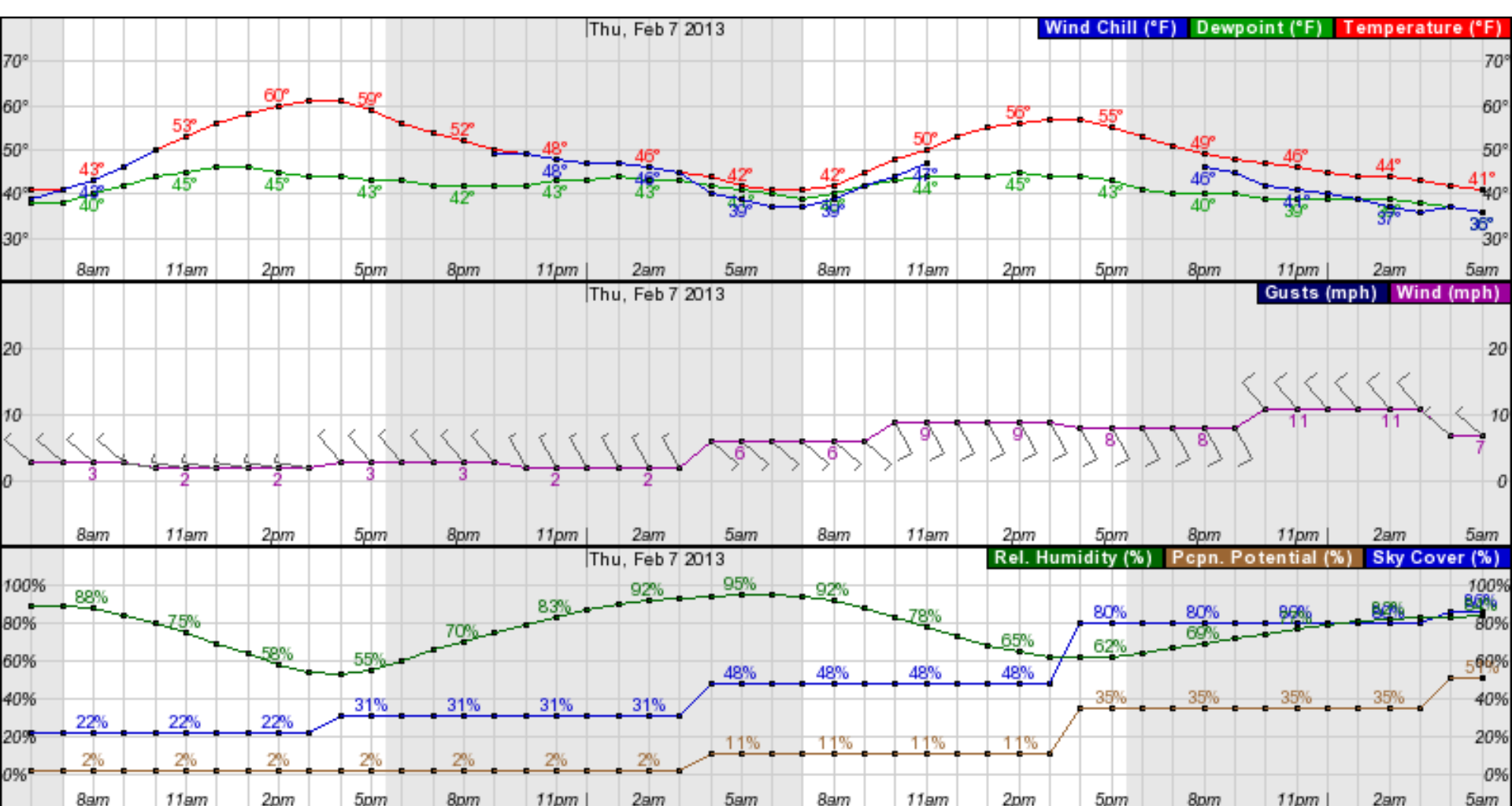


Fresno

Wednesday: Minimal cloud cover

Thursday: Clouds increasing, cloud cover ~50%

Wednesday → Thursday →



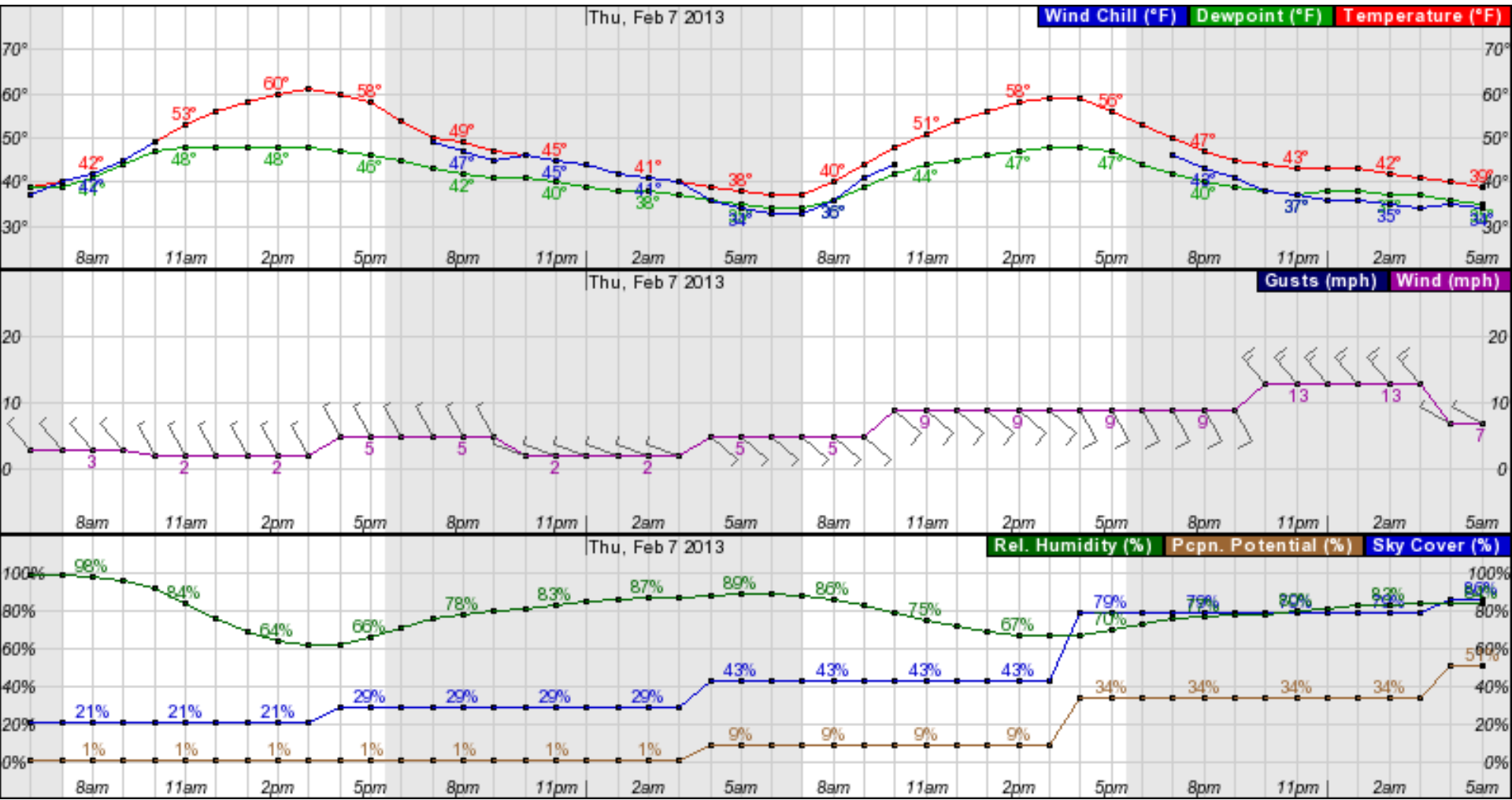
Hanford

Wednesday: Minimal cloud cover

Thursday: Clouds increasing, cloud cover ~40%

Wednesday →

Thursday →



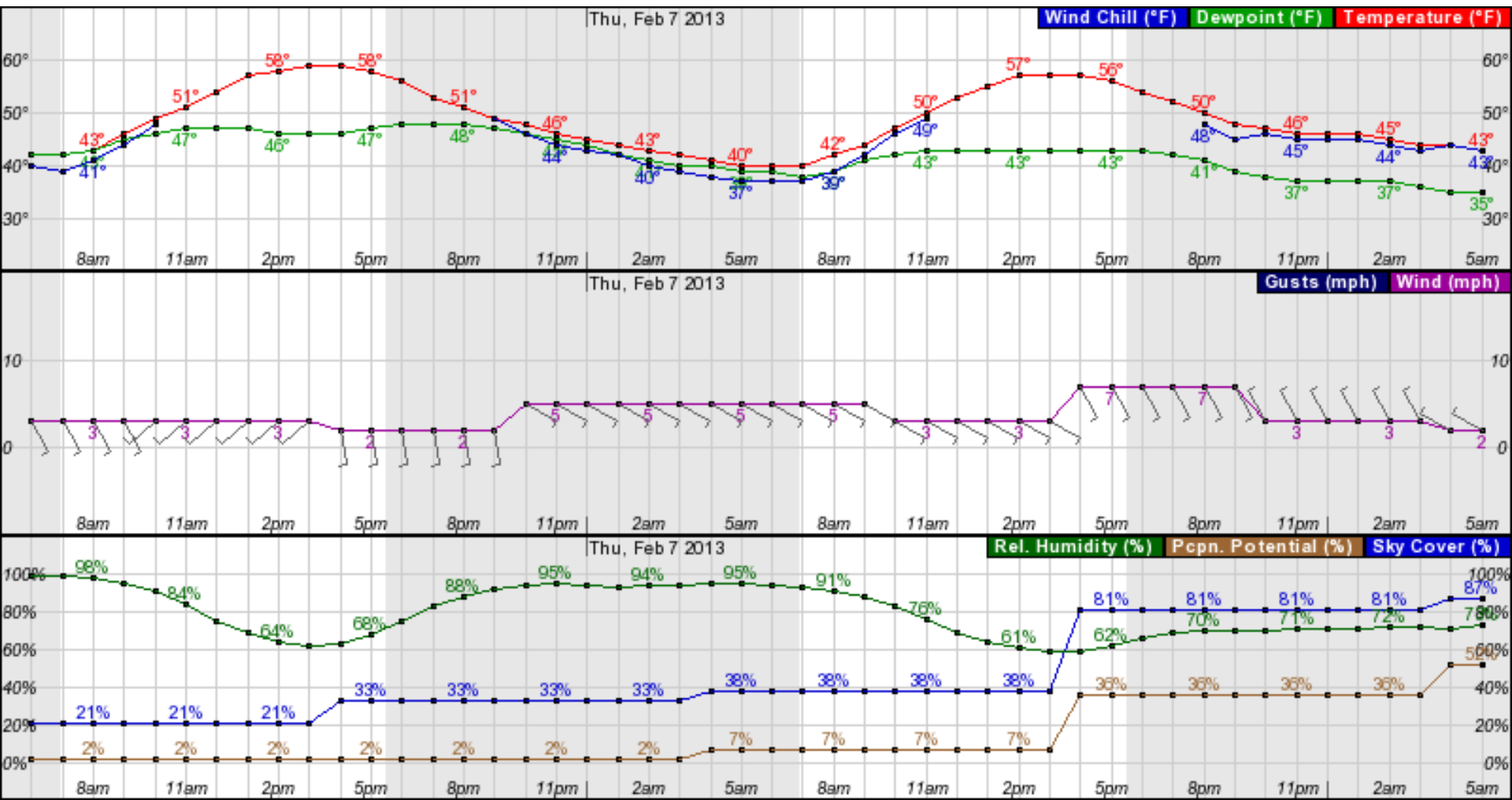
Bakersfield

Wednesday: Minimal cloud cover

Thursday: Clouds increasing, cloud cover ~40%

Wednesday →

Thursday →



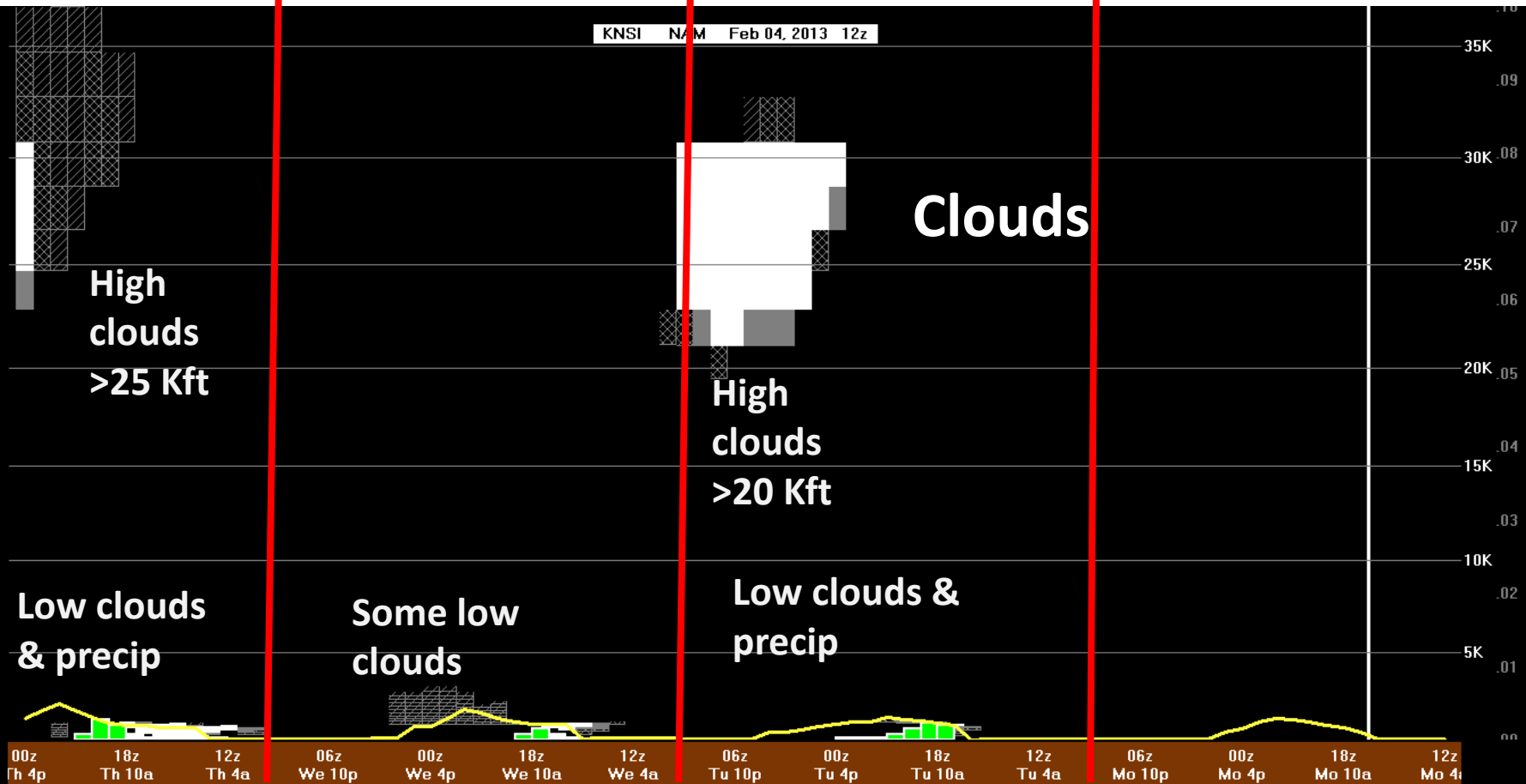
San Nicolas : BUFKIT NAM 12 UTC Monday Feb. 4

Thursday

Wednesday

Tuesday

Today



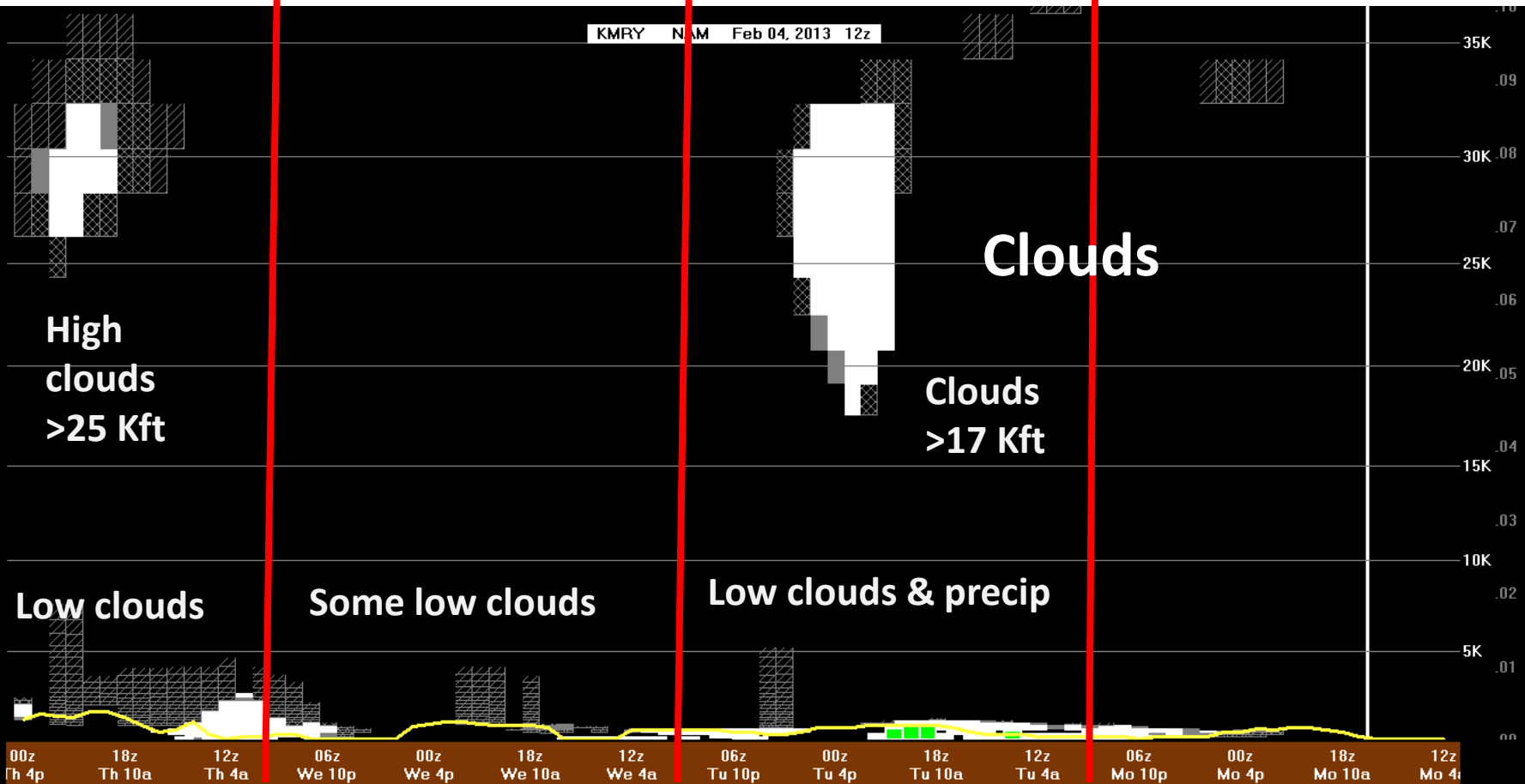
Monterey : BUFKIT NAM 12 UTC Monday Feb. 4

Thursday

Wednesday

Tuesday

Today



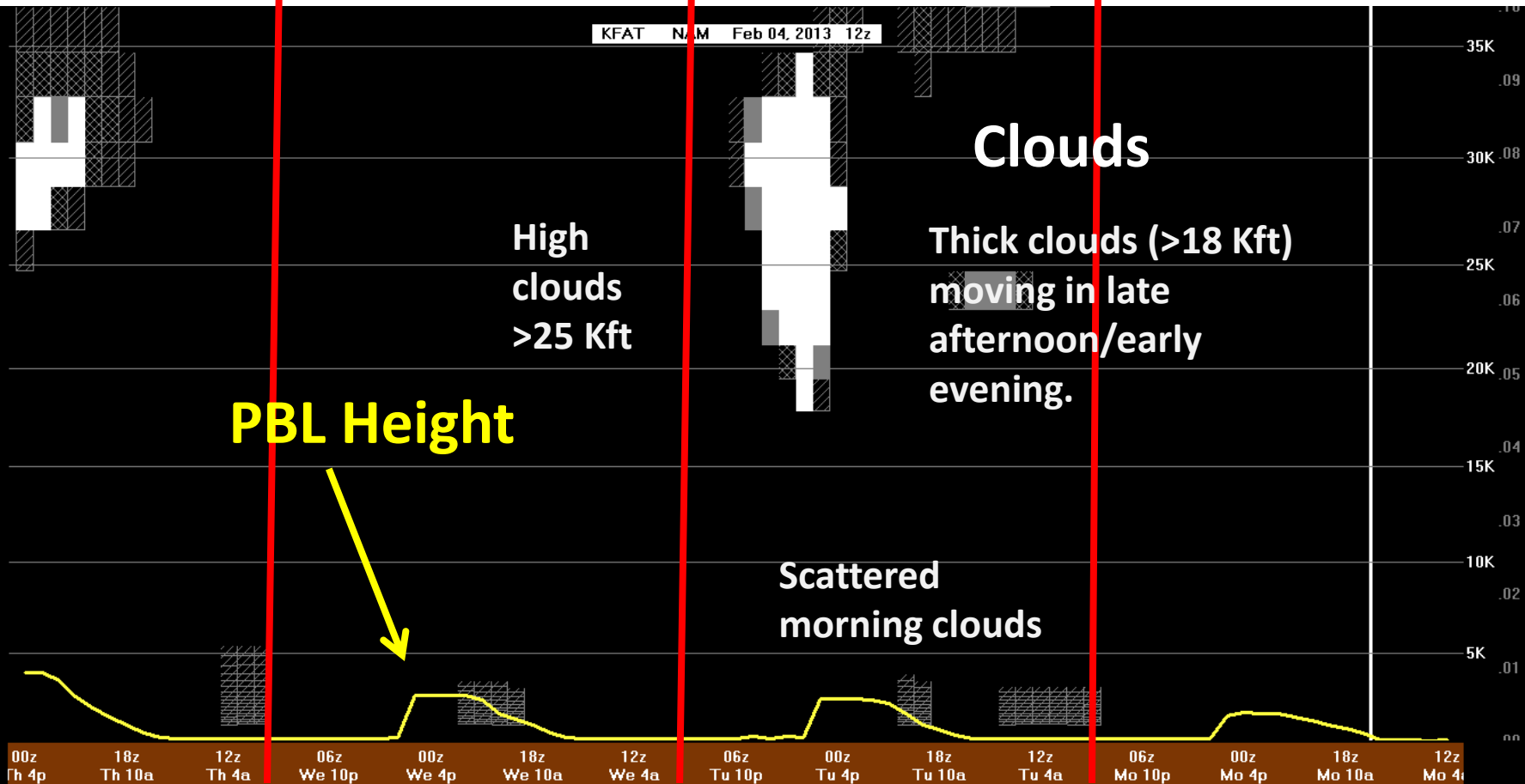
Fresno : BUFKIT NAM 12 UTC Monday Feb. 4

Thursday

Wednesday

Tuesday

Today



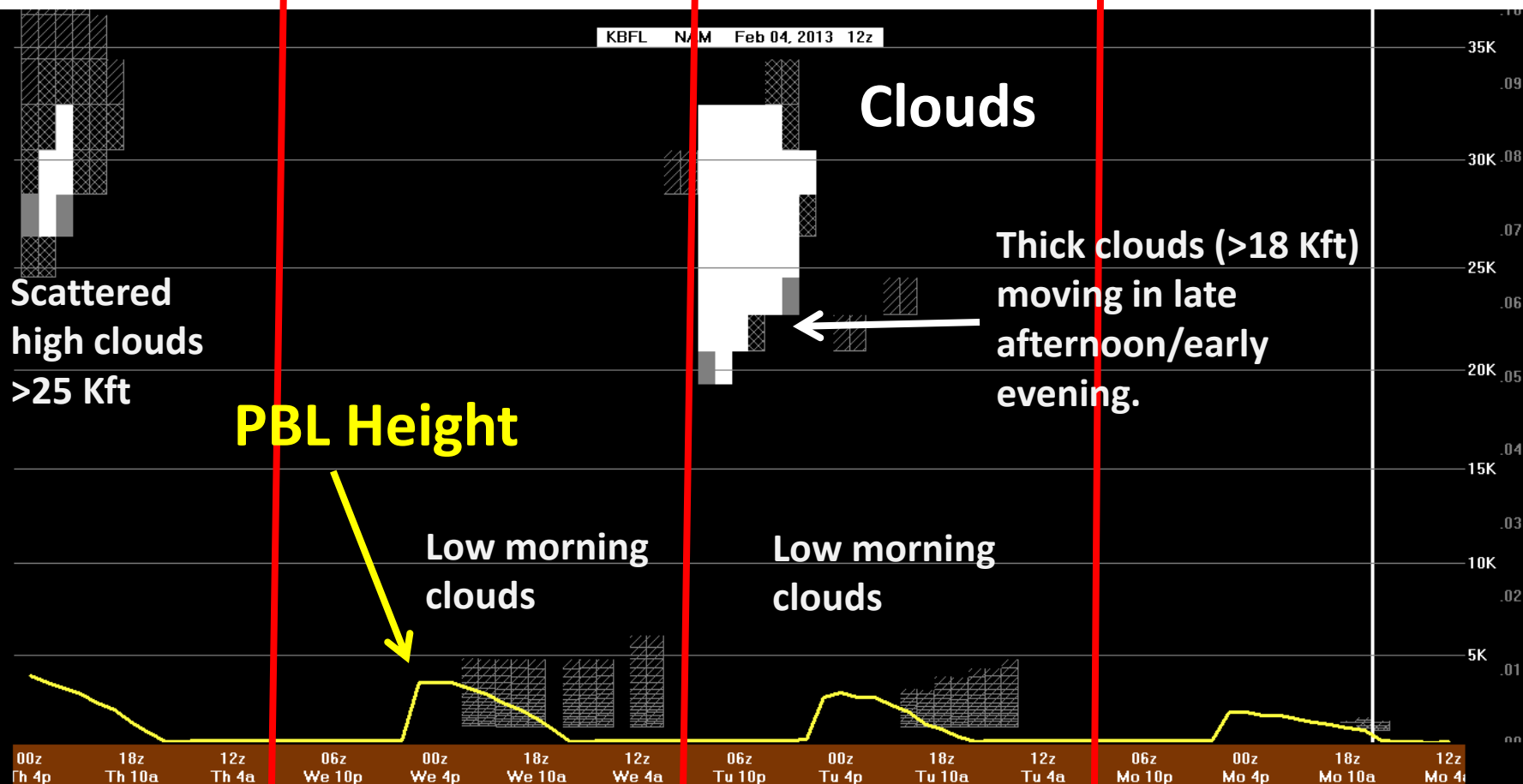
Bakersfield : BUFKIT NAM 12 UTC Monday Feb. 4

Thursday

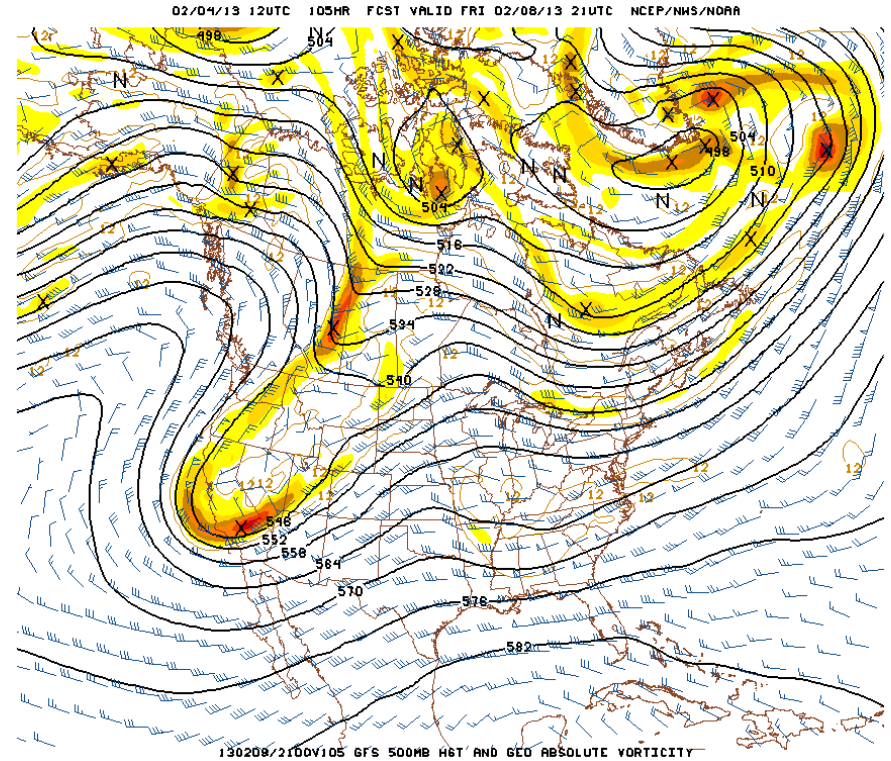
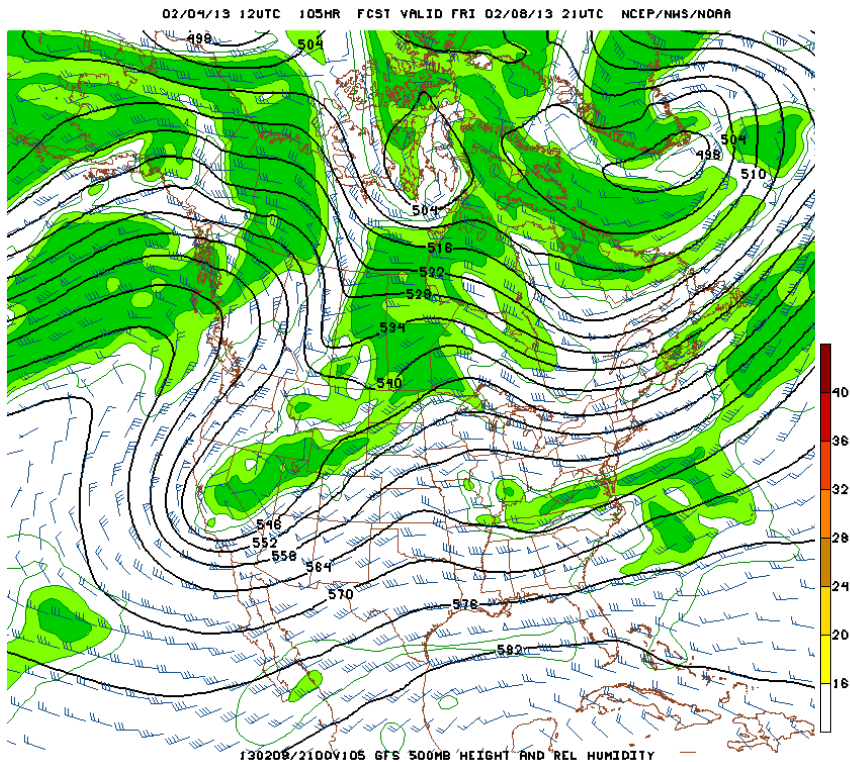
Wednesday

Tuesday

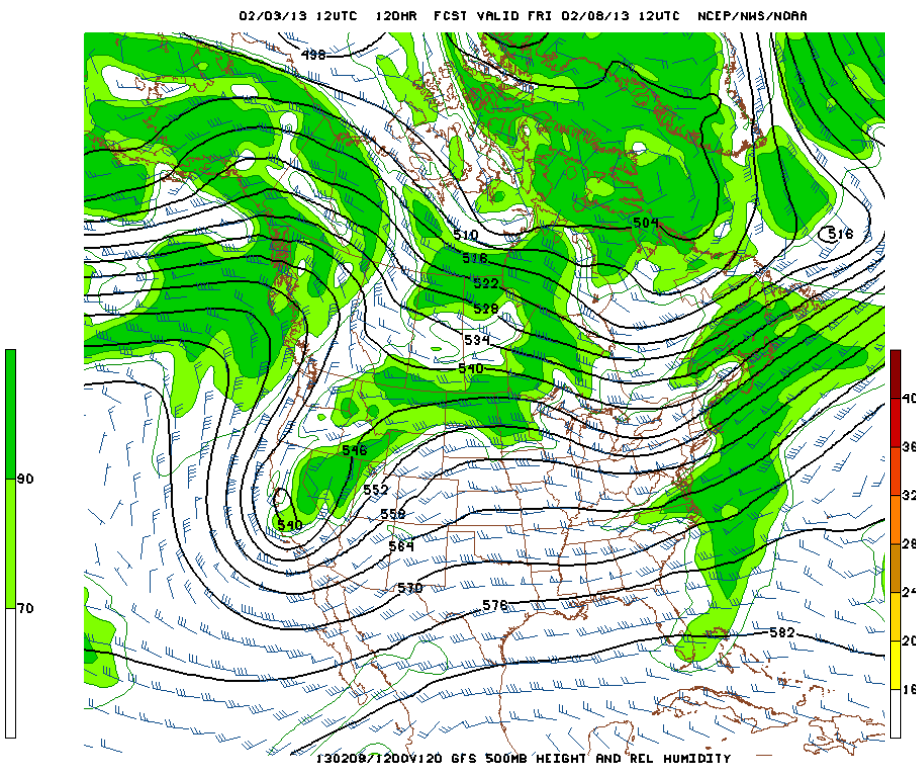
Today



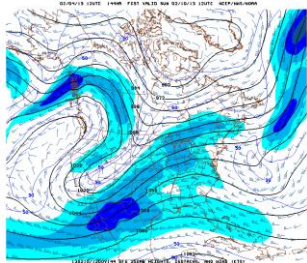
Friday: The trough moves into southern and central CA. Probability of precipitation likely over portions of central CA, and thunderstorms are possible.



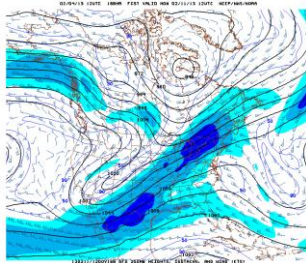
Saturday and beyond: NCEP and ECMWF continue to be in agreement over the movement of the deep trough/closed low to the east Friday night and into Saturday. Clouds likely to remain over the weekend. Freeze events possible Sunday and Monday mornings.



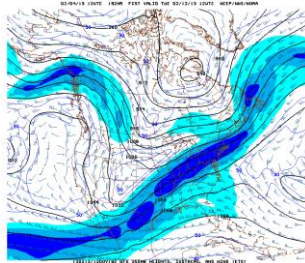
GFS - 250 mb winds - Extended forecast



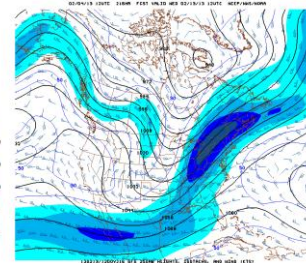
Su 2/10



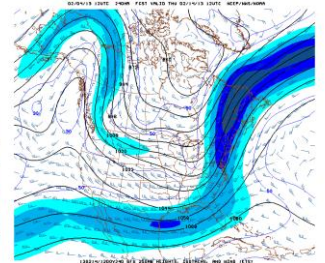
Mo 2/11



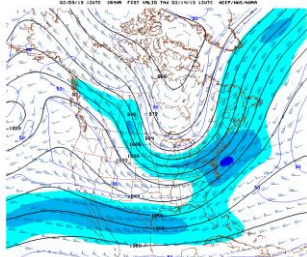
Tu 2/12



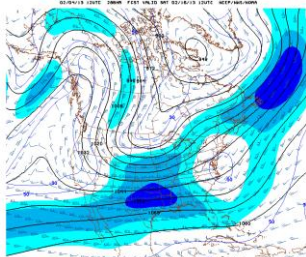
We 2/13



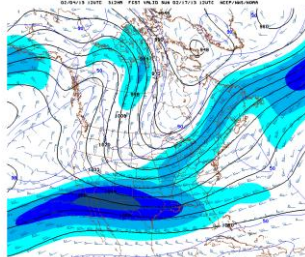
Th 2/14



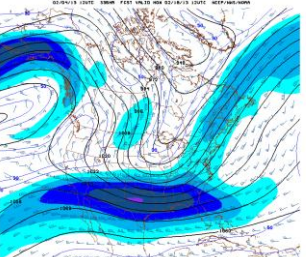
Fr 2/15



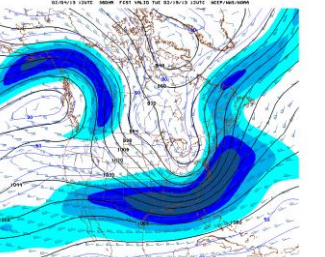
Sa 2/16



Su 2/17

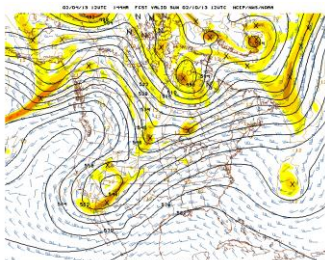


Mo 2/18

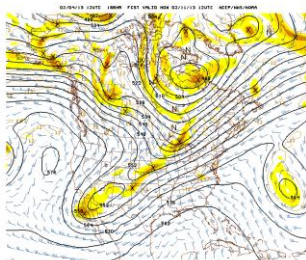


Tu 2/19

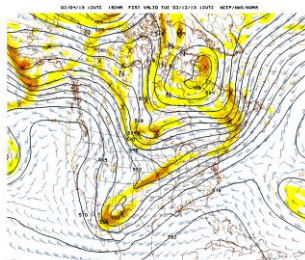
GFS - 500 mb vorticity - Extended forecast



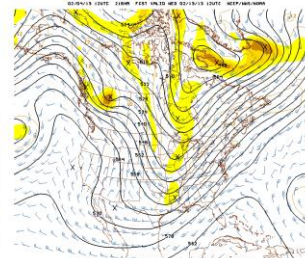
Su 2/10



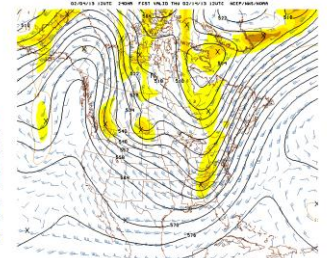
Mo 2/11



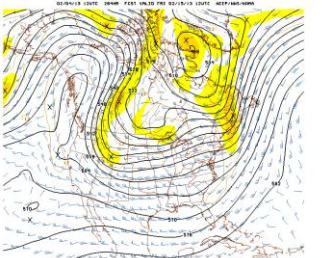
Tu 2/12



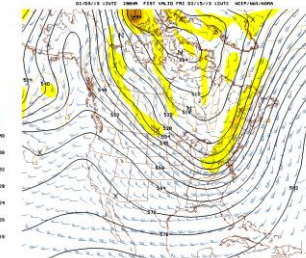
We 2/13



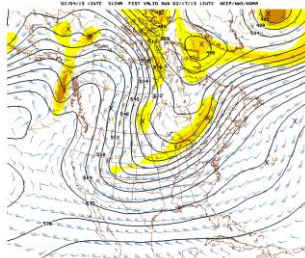
Th 2/14



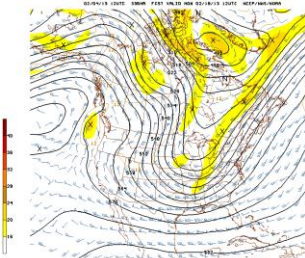
Fr 2/15



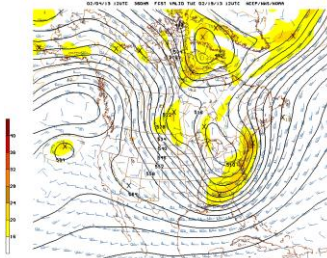
Sa 2/16



Su 2/17



Mo 2/18



Tu 2/19

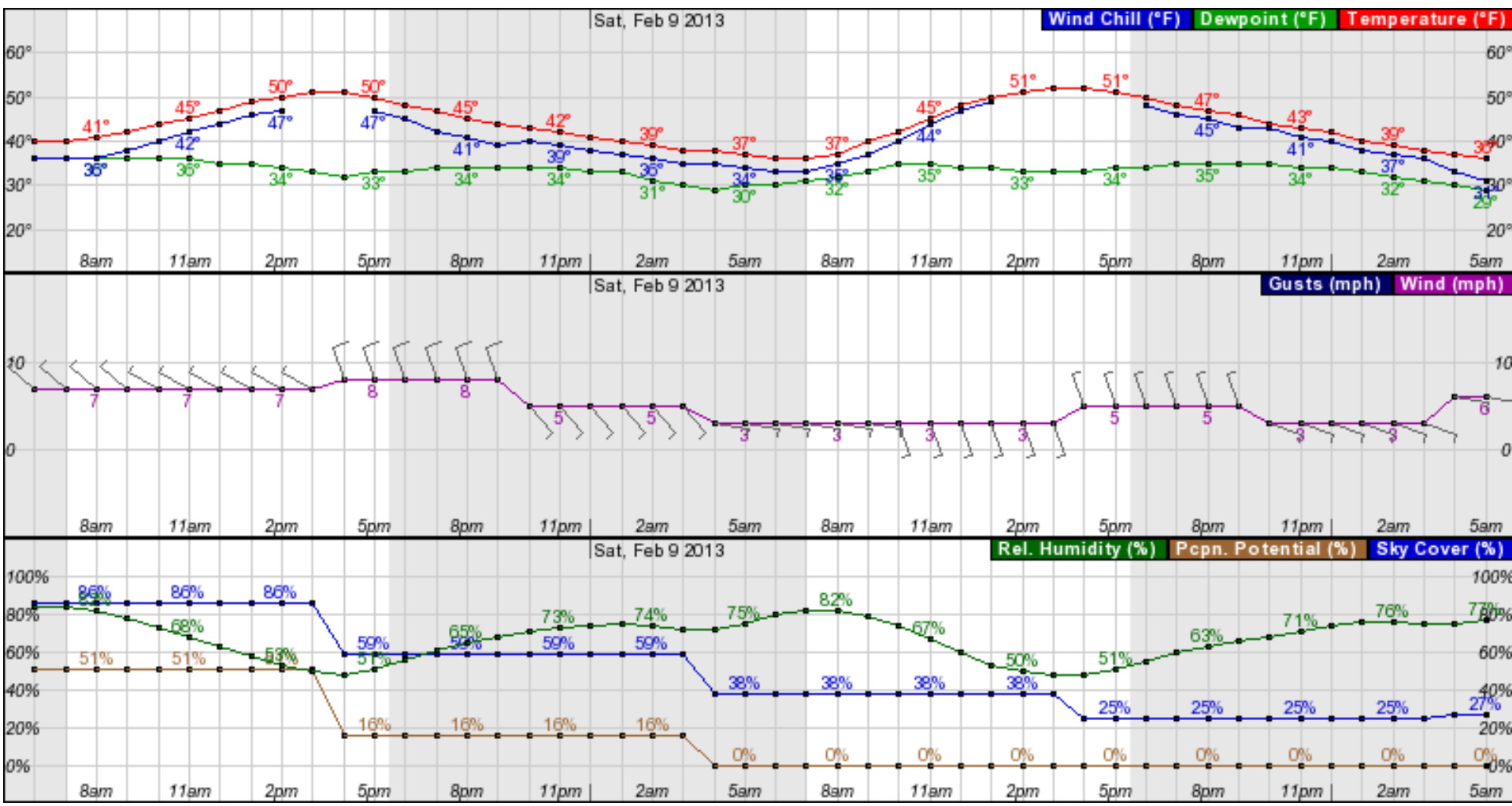
Fresno

Friday: Cloud cover ~80%

Saturday: Cloud cover ~40%

Friday →

Saturday →



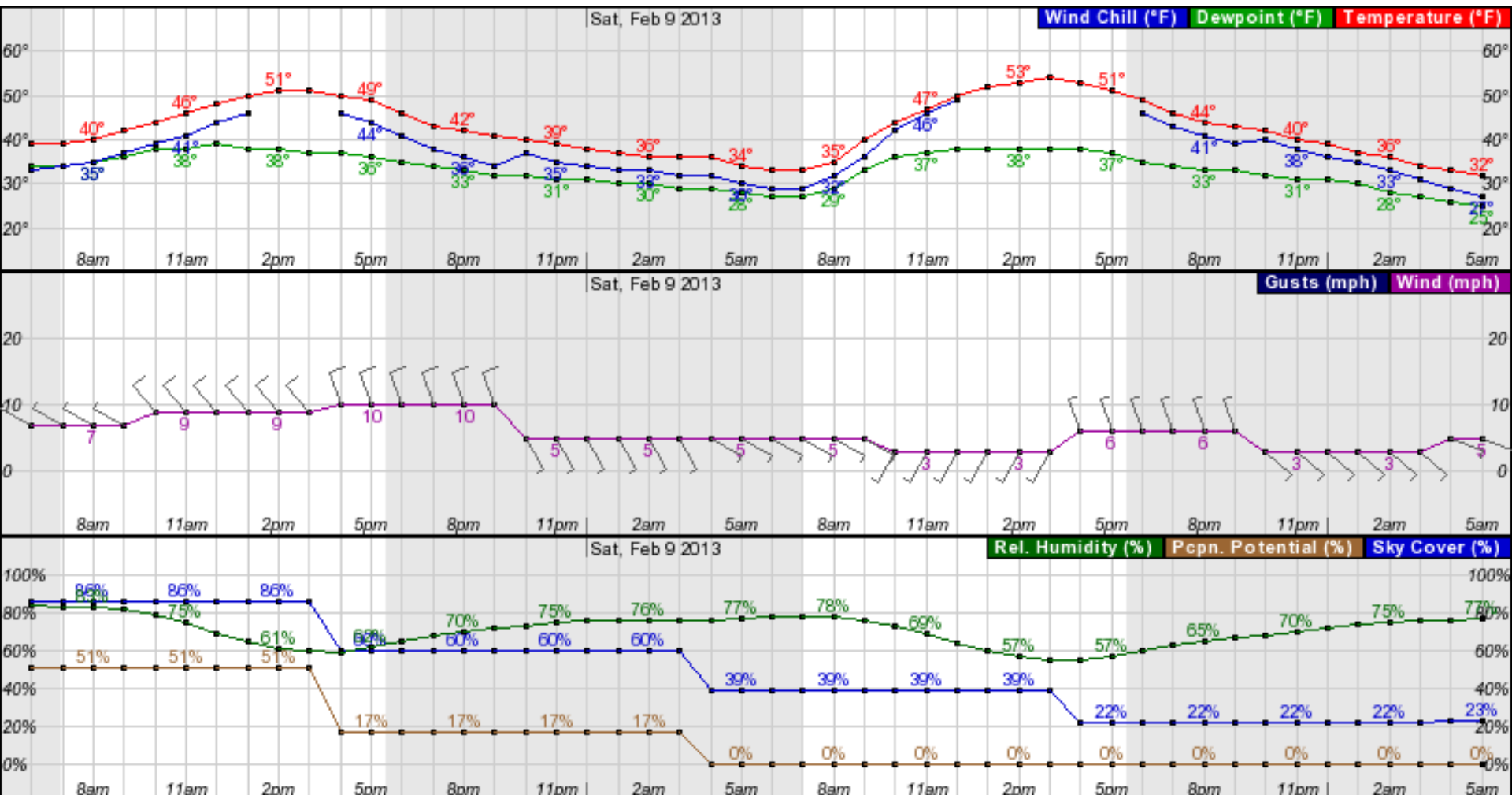
Hanford

Friday: Cloud cover ~80%

Saturday: Cloud cover ~40%

Friday →

Saturday →



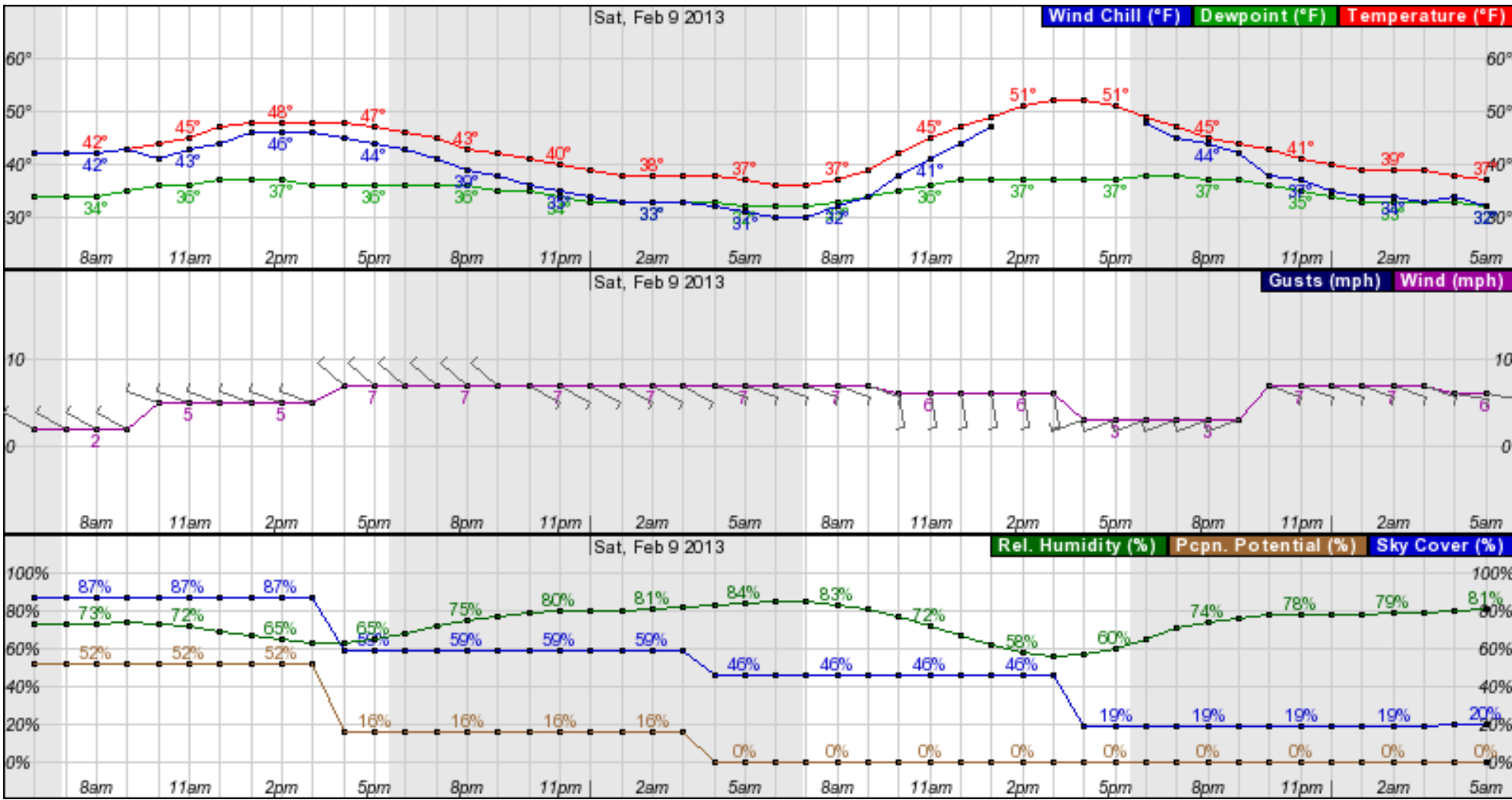
Bakersfield

Friday: Cloud cover ~80%

Saturday: Cloud cover ~50%

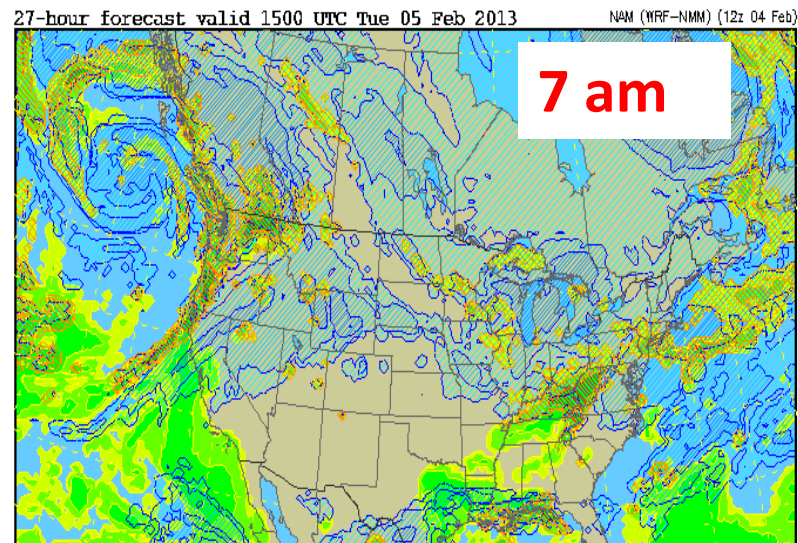
Friday →

Saturday →

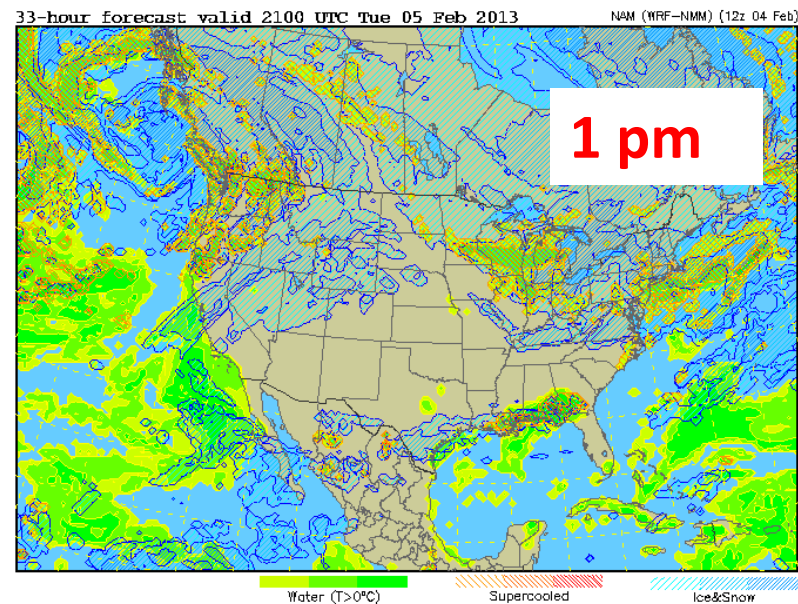


Tomorrow: NAM – High level clouds move into the SJV from the north. Low-level stratus off the coast, with cirrus covering the northern extent off the Bay Area.

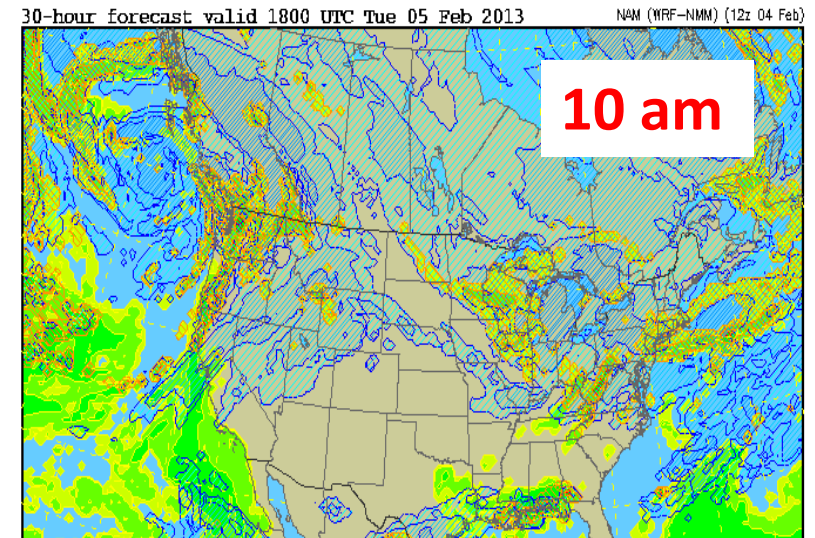
Integrated liquid and frozen hydrometeors (all levels)



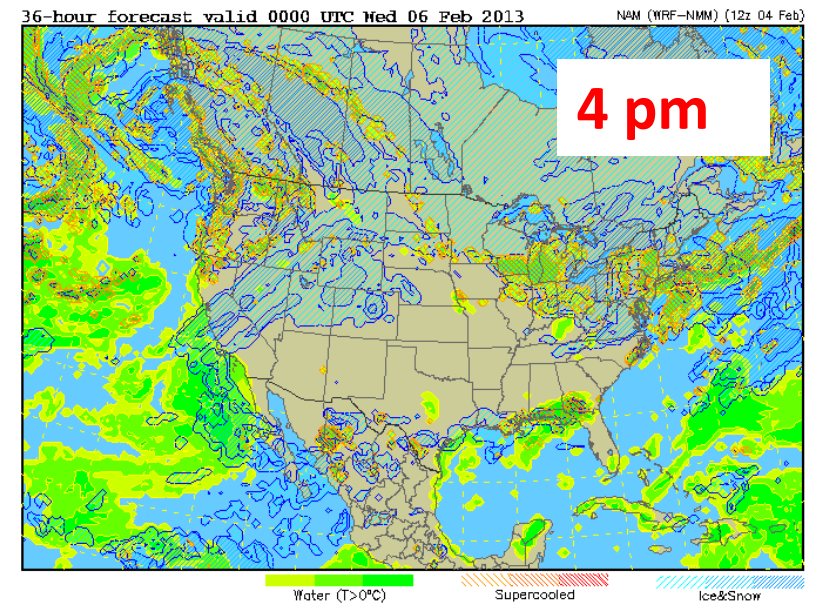
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



Tuesday: GEOS5 – Clouds covering southern/western SJV during morning move out by afternoon. Low level clouds move off the coast, high clouds move in during the day.

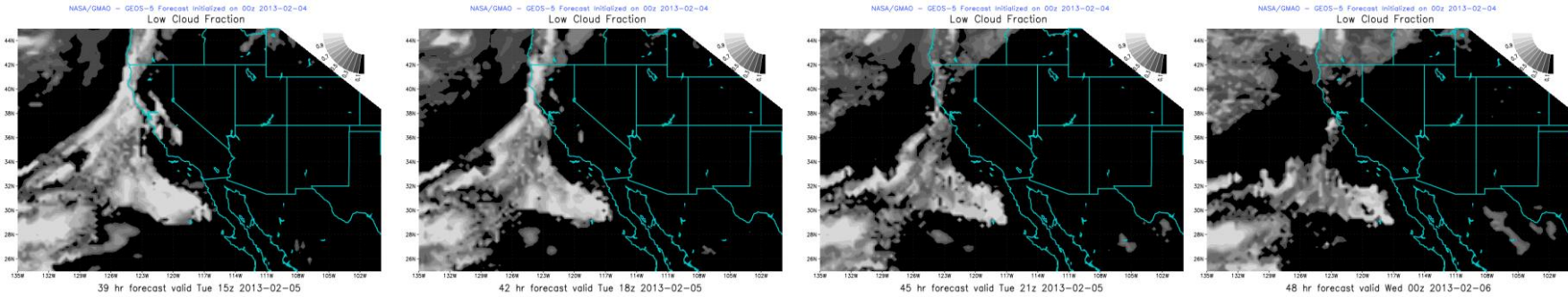
7 am

10 am

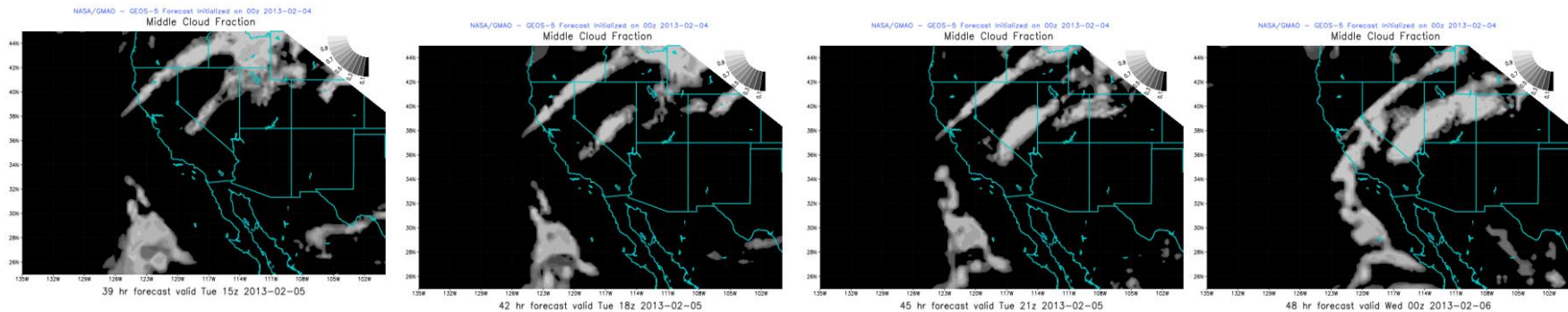
1 pm

4 pm

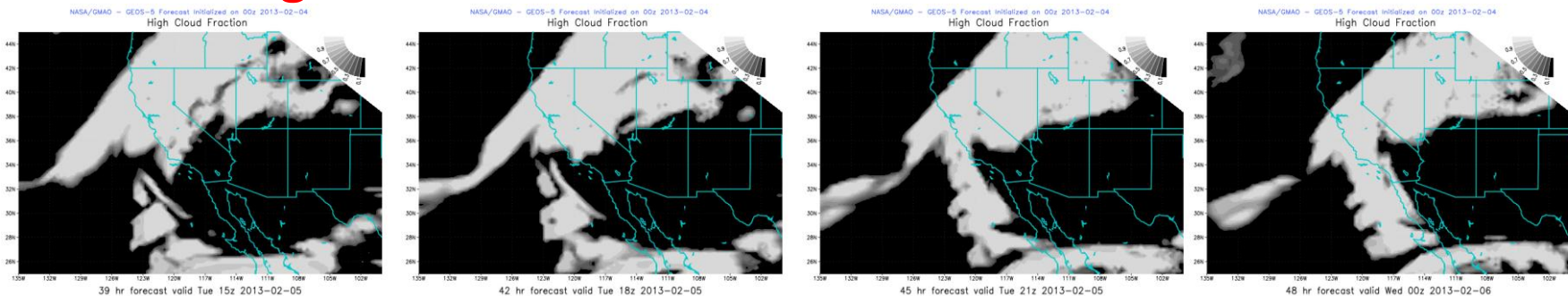
GEOS5 – Low level



GEOS5 – Mid level



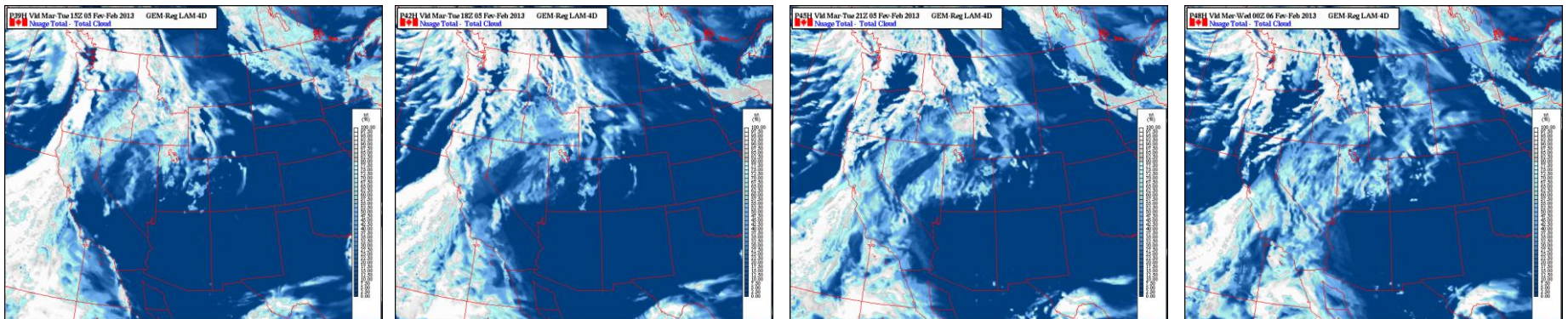
GEOS5 – High level



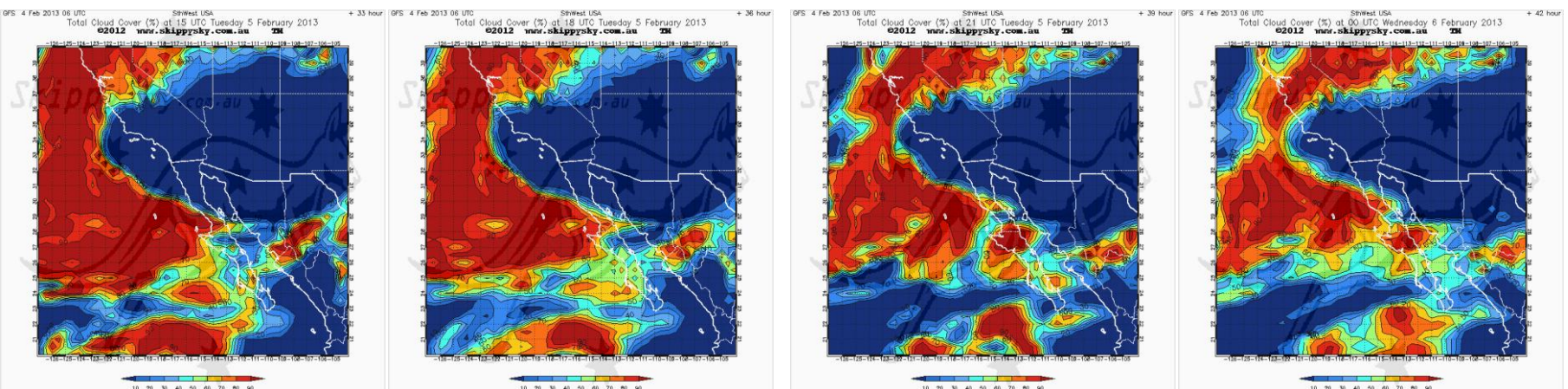
Tomorrow: Canadian – Cirrus moving into the SJV from the north, covering the study region by afternoon. The low level clouds present in the morning offshore decrease somewhat in extent by afternoon; cirrus also present. GFS – Southern SJV remains clear of cloud; clouds offshore not as near to coast but also decrease during the day.

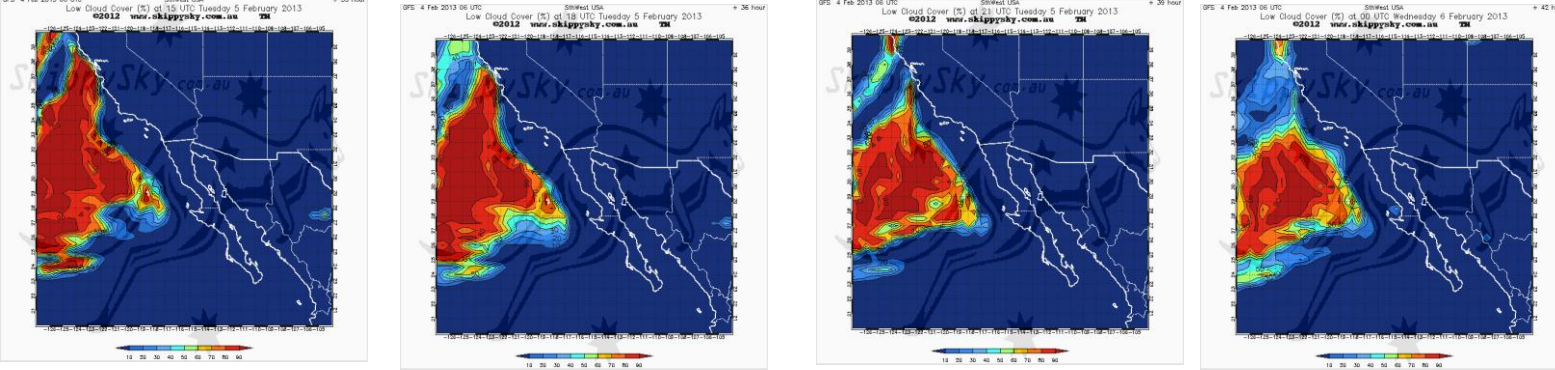
7 am 10 am 1 pm 4 pm

Canadian

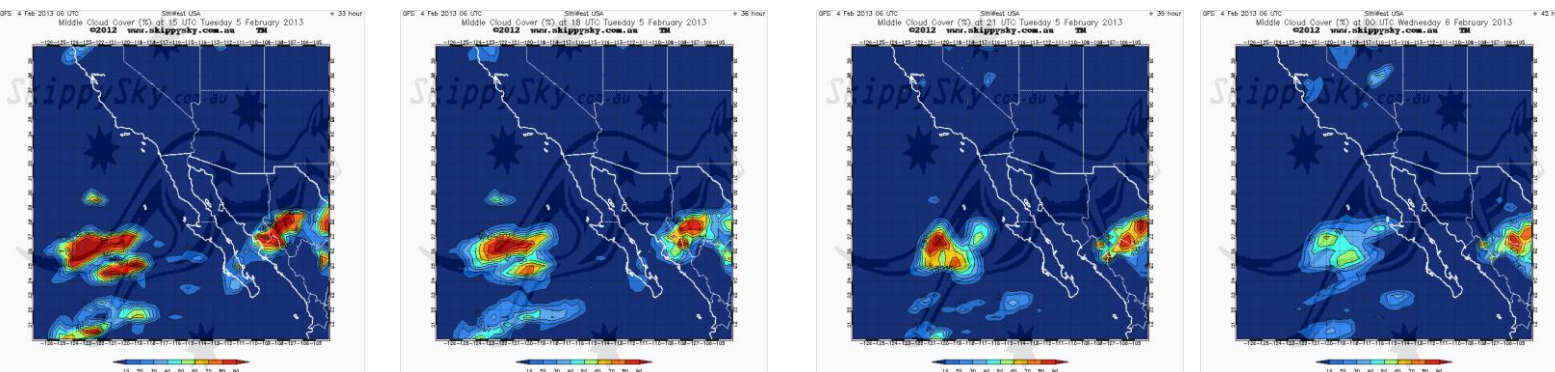


GFS – Total Cloud

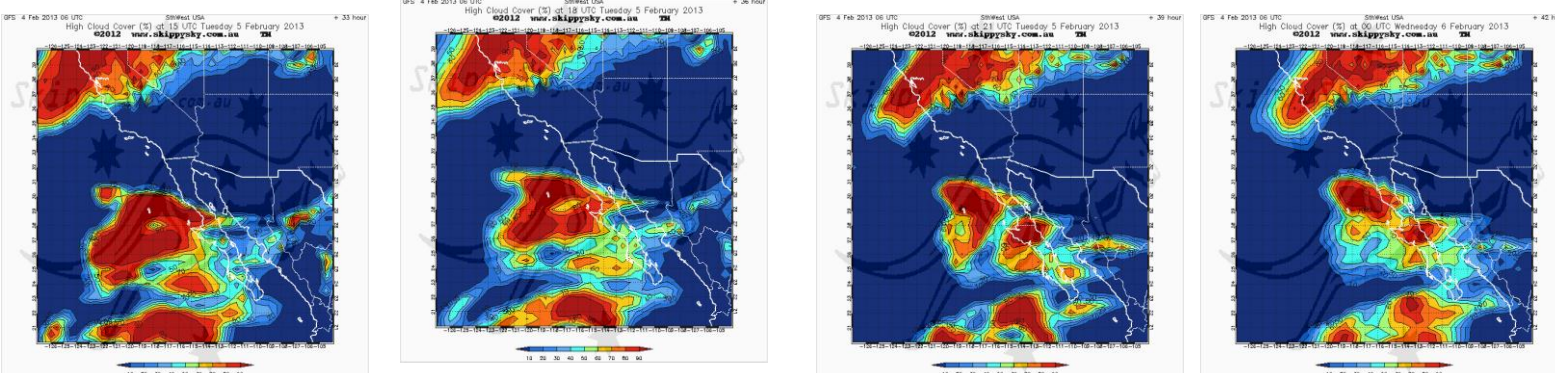




GFS - Low level



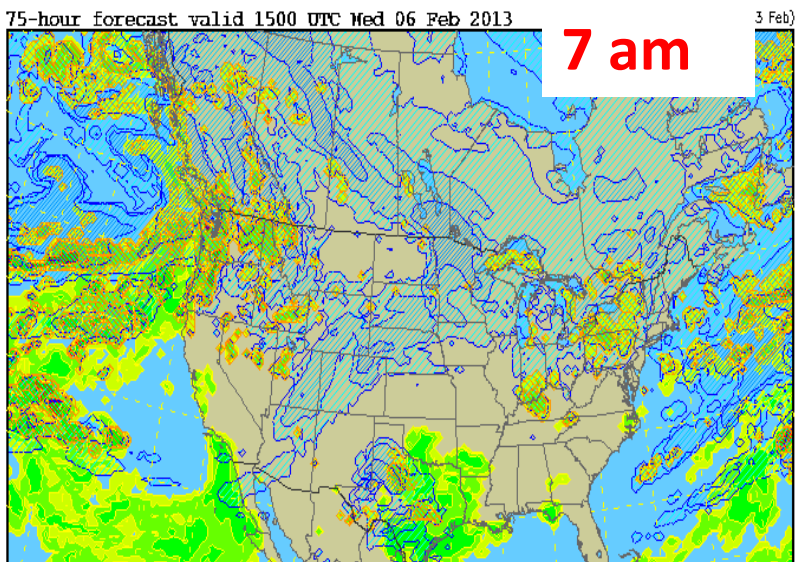
GFS - Mid level



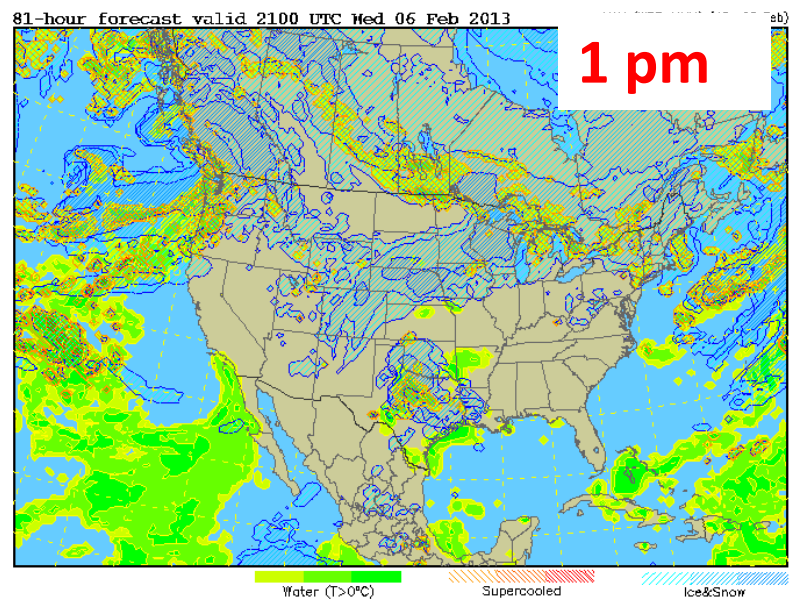
GFS - High level

Wednesday: NAM – SJV again clear of clouds. Both high and low level clouds clear from the coast from the Bay Area to LA.

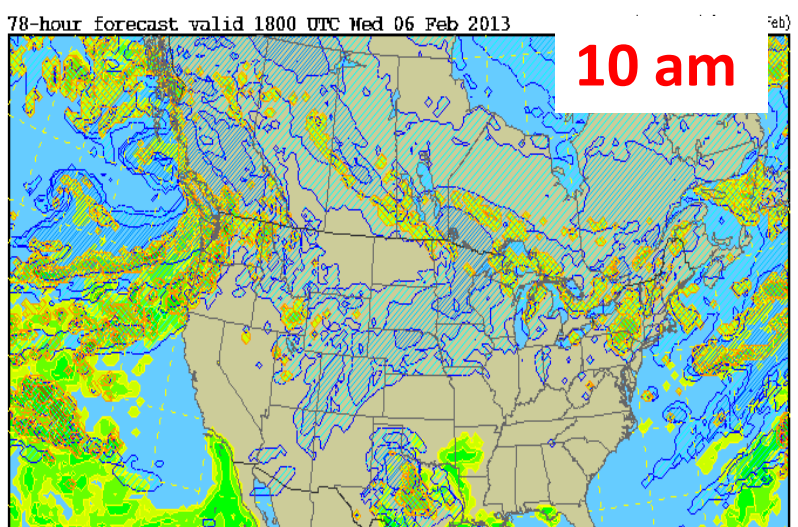
Integrated liquid and frozen hydrometeors (all levels)



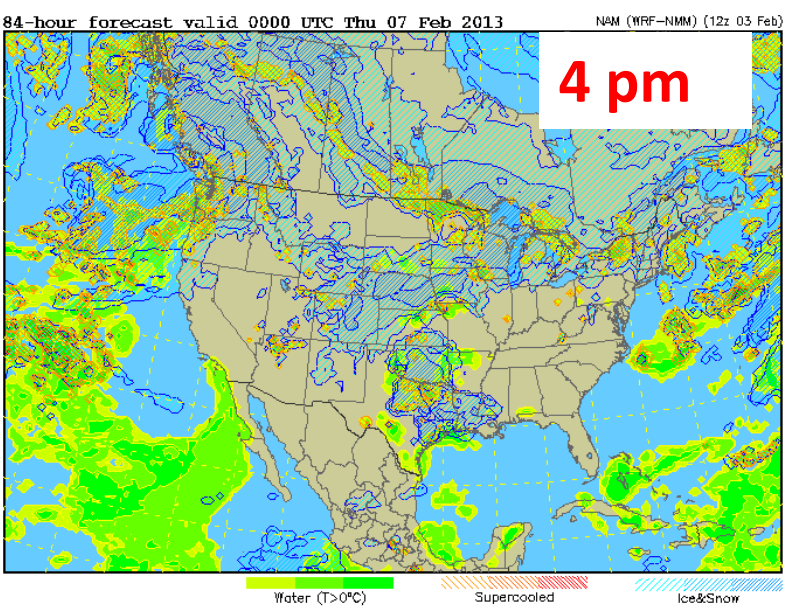
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)

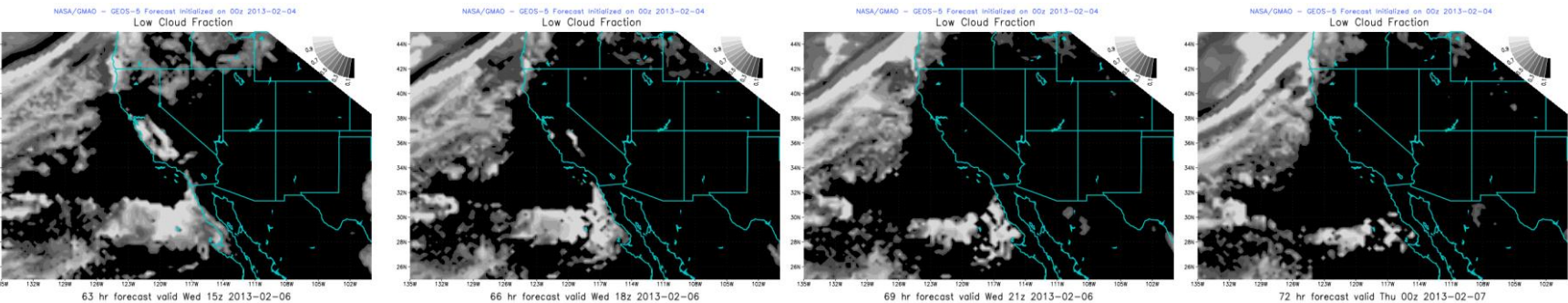


Water (T>0°C) Supercooled Ice&Snow

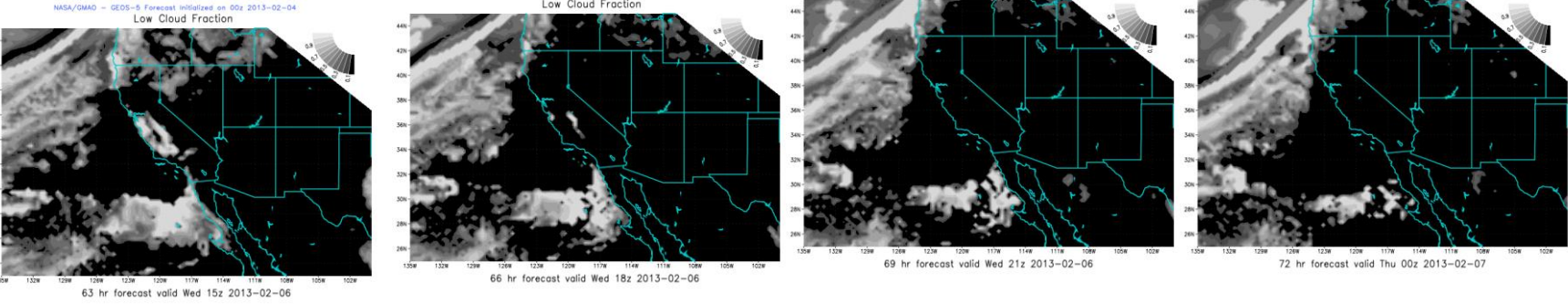
Wednesday: GEOS5 – Some mid and high level clouds cover the western and southern SJV during morning, moving off by afternoon. Coasts are mainly clear of cloud.

7 am 10 am 1 pm 4 pm

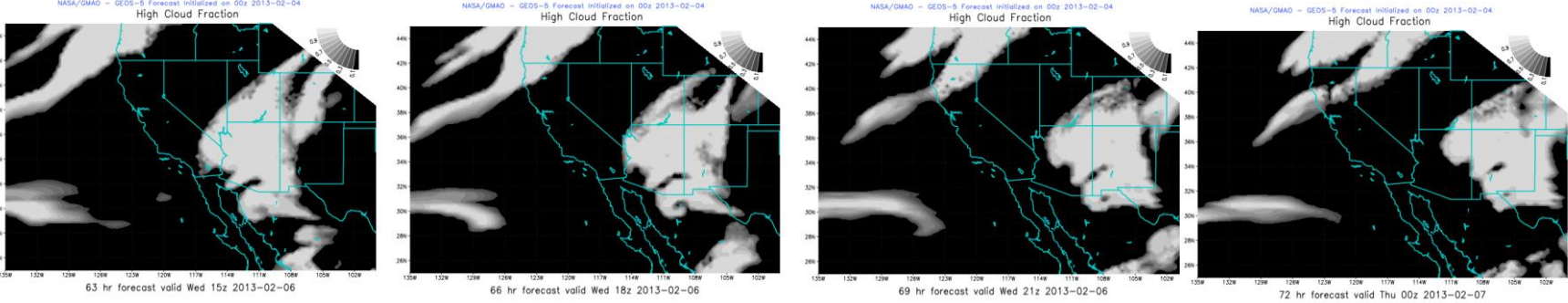
GEOS5 – Low level



GEOS5 – Mid level

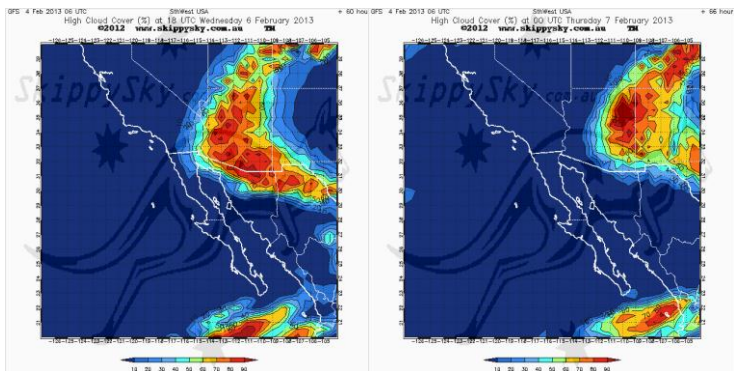


GEOS5 – High level

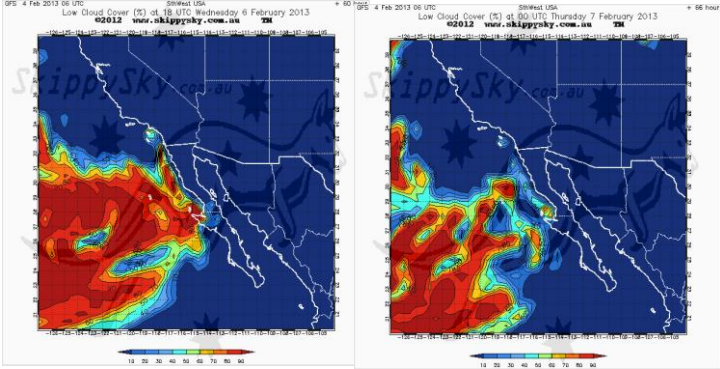


10 am

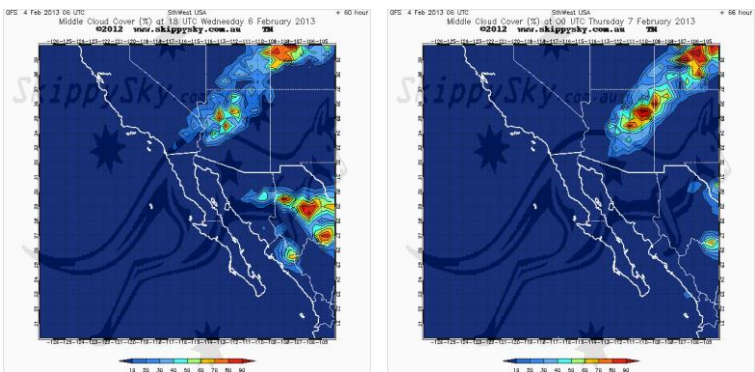
4 pm



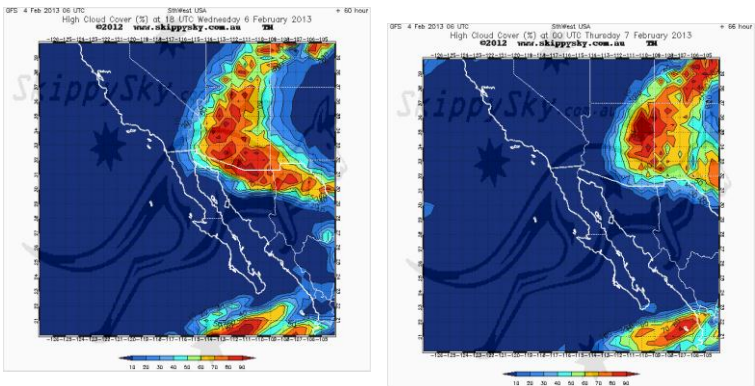
GFS - Total Cloud



GFS - Low level



GFS - Mid level



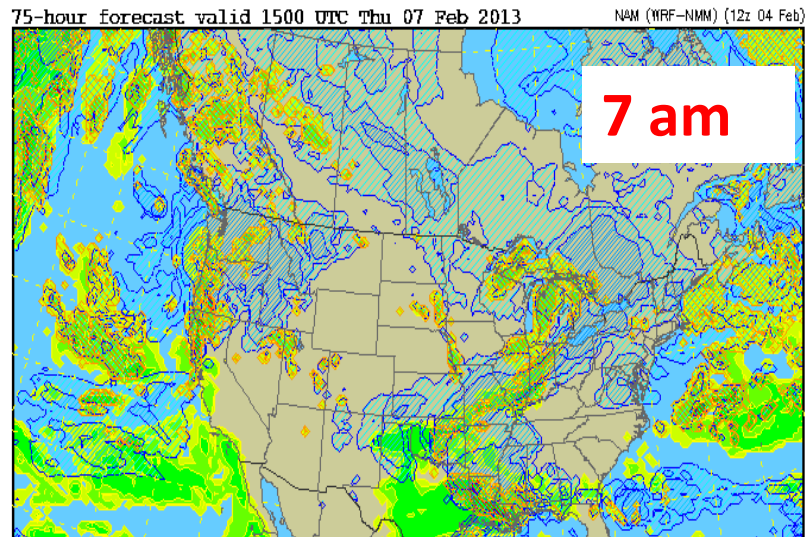
GFS - High level

Wednesday: GFS

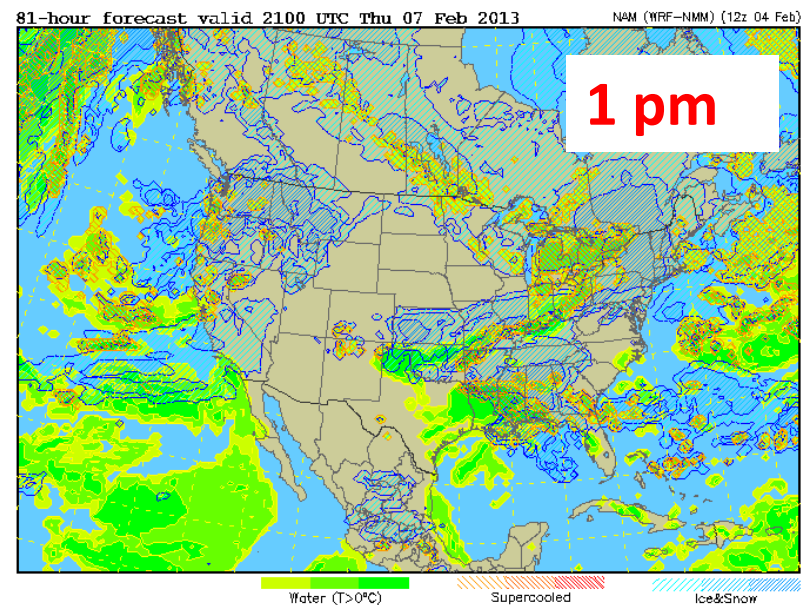
– High level clouds in southern SJV clear out by afternoon. Coastal waters cloud-free.

Thursday: High-level clouds moving in from the north cover the SJV and coastal waters by afternoon. Some clearing of the stratus deck off the central CA coast.

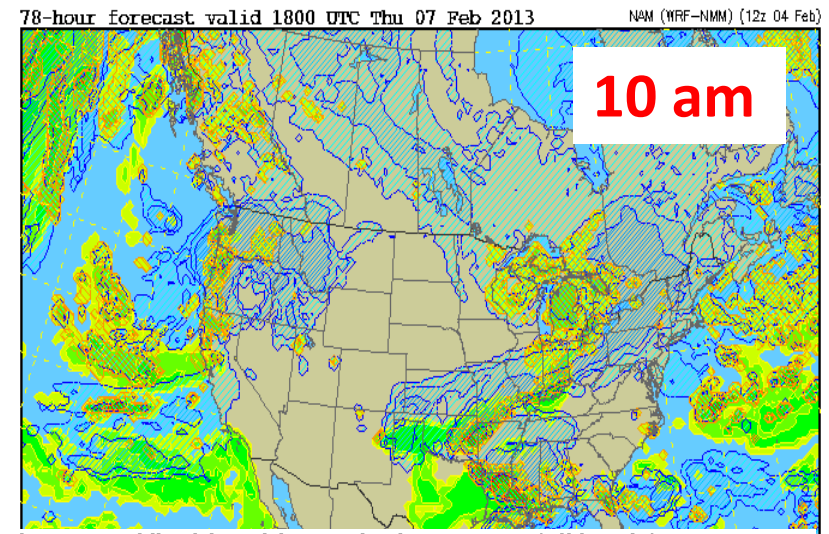
Integrated liquid and frozen hydrometeors (all levels)



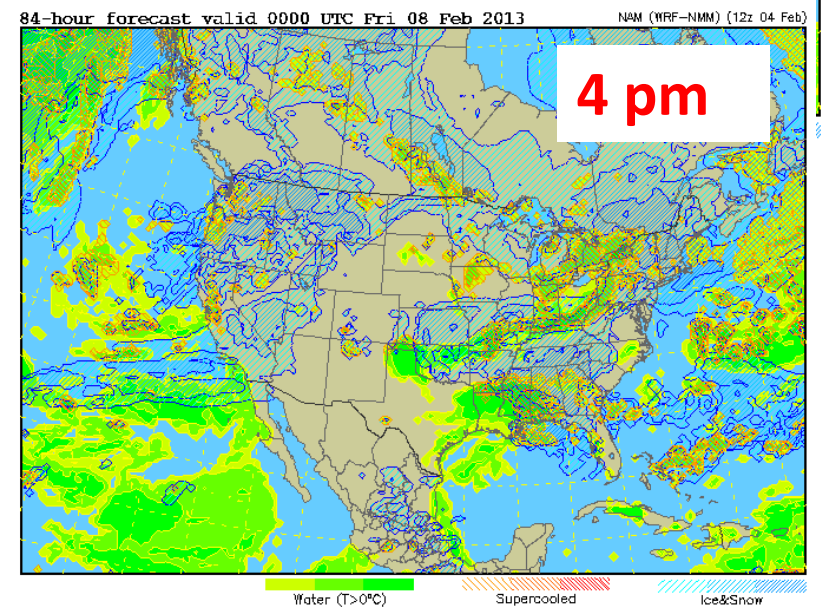
Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



Integrated liquid and frozen hydrometeors (all levels)



Thursday: GEOS5 – SJV mainly clear of clouds after early morning, but cold front moving into the region. Low level clouds offshore of CA.

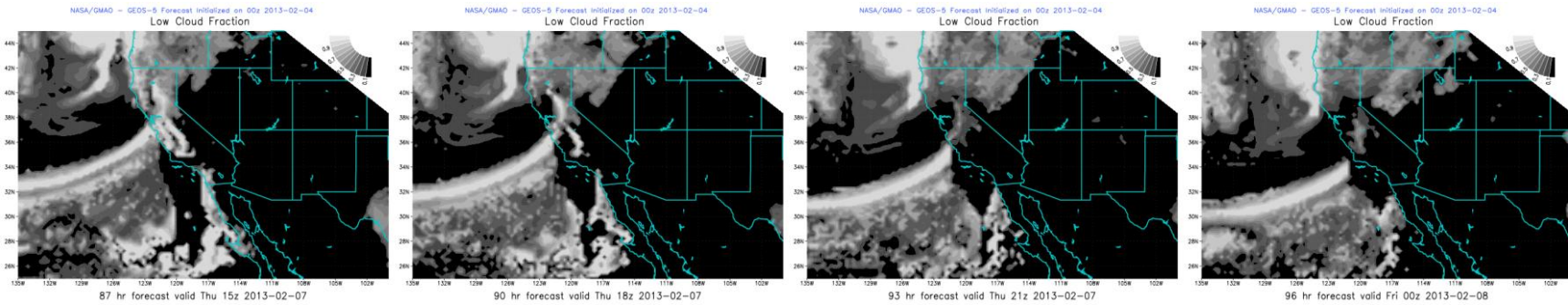
7 am

10 am

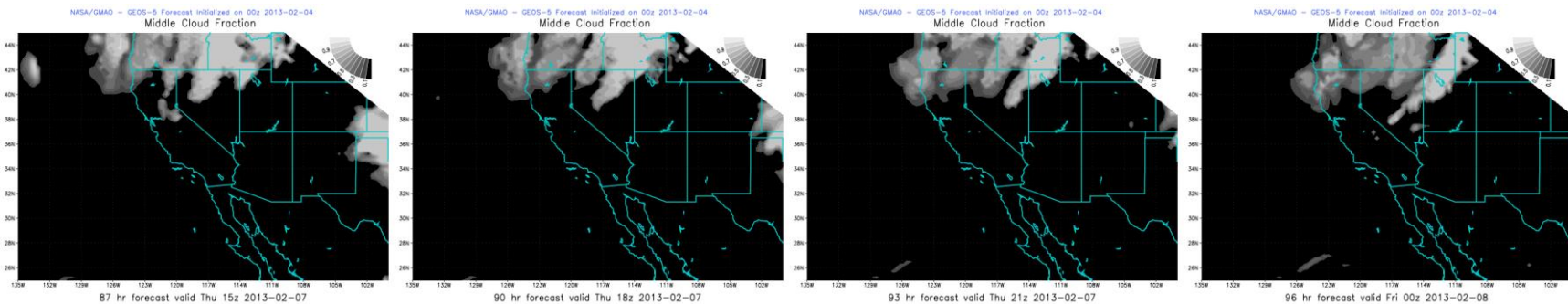
1 pm

4 pm

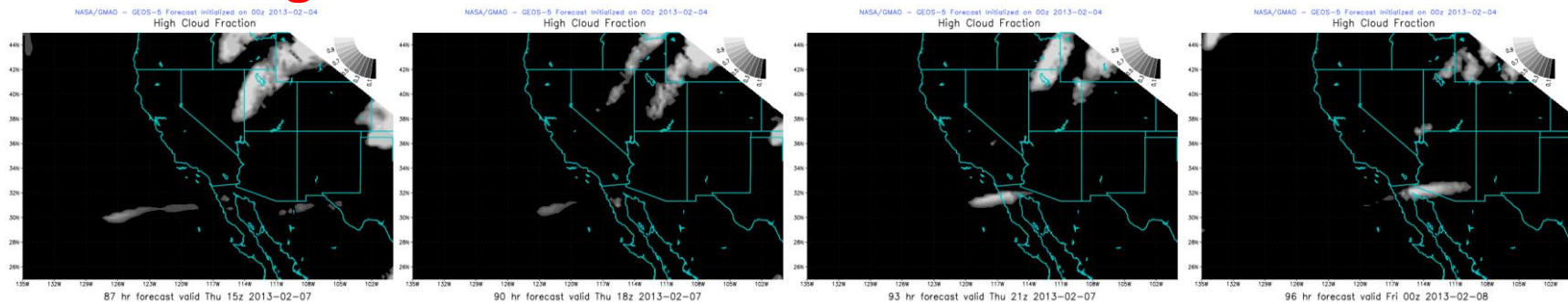
GEOS5 – Low level



GEOS5 – Mid level



GEOS5 – High level



AREA FORECAST DISCUSSION
NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY - HANFORD CA
1258 AM PST MON FEB 4 2013

.SYNOPSIS...

THERE IS LITTLE CHANGE EXPECTED FOR THE LOCAL AREA WITH DRY CONDITIONS AND NEAR NORMAL TEMPERATURES CONTINUING THROUGH THURSDAY AFTERNOON. AN APPROACHING SYSTEM LATER THIS WEEK WILL BRING INCREASED CHANCES FOR **PRECIPITATION** TO THE AREA.

&&

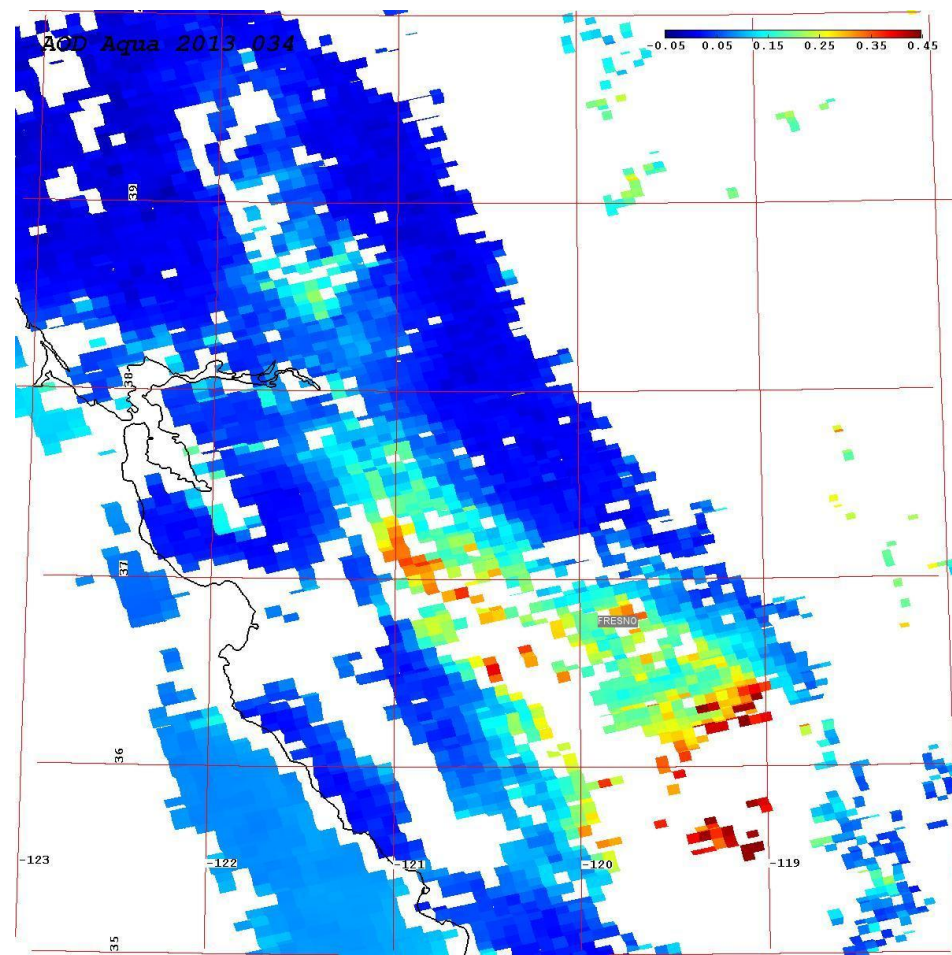
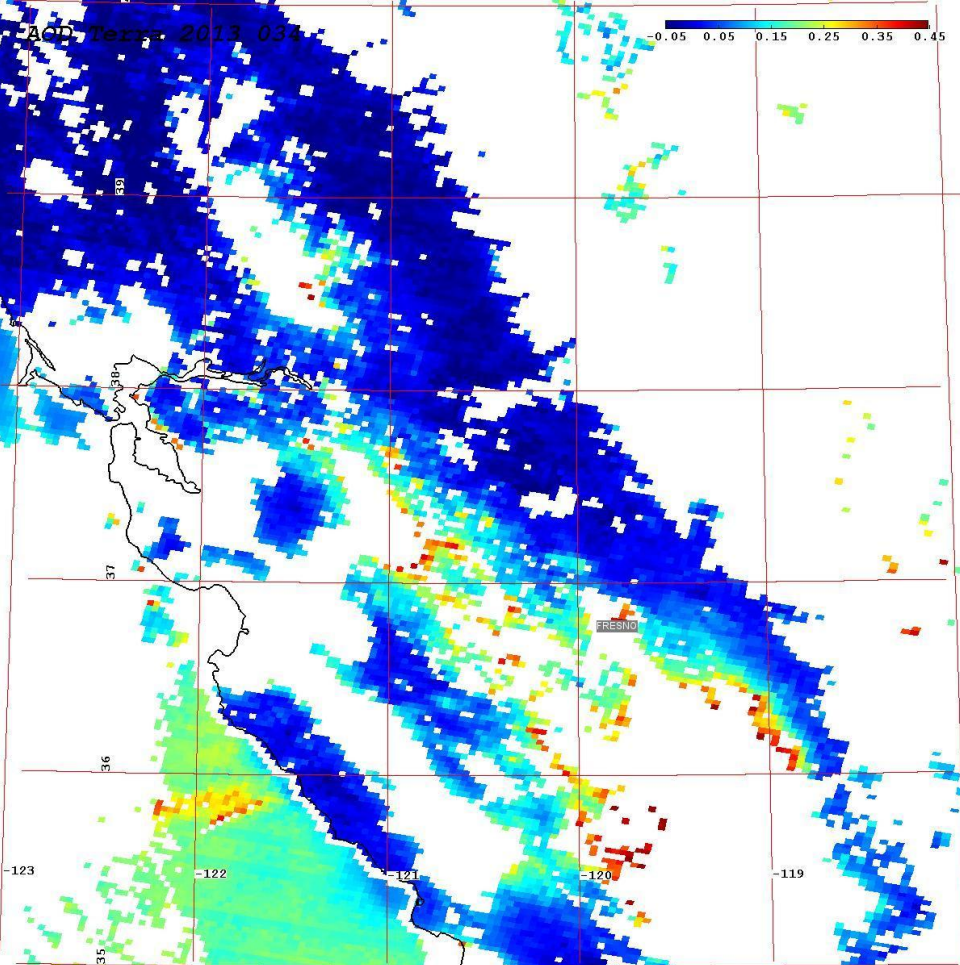
.DISCUSSION...CLEAR SKIES OVER THE FORECAST AREA WILL ALLOW FOR THE QUICK FORMATION OF DENSE **FOG** OVER THE SJV OVERNIGHT AND THE **DENSE FOG ADVISORY** SHOULD BE REALIZED FOR SURE. SATELLITE IMAGERY SHOWS JUST SOME **CIRRUS** CLOUDS DROPPING SOUTHEAST TOWARDS THE AREA HOWEVER THEY WILL BE THIN ENOUGH TO NOT HINDER **RADIATION FOG**.

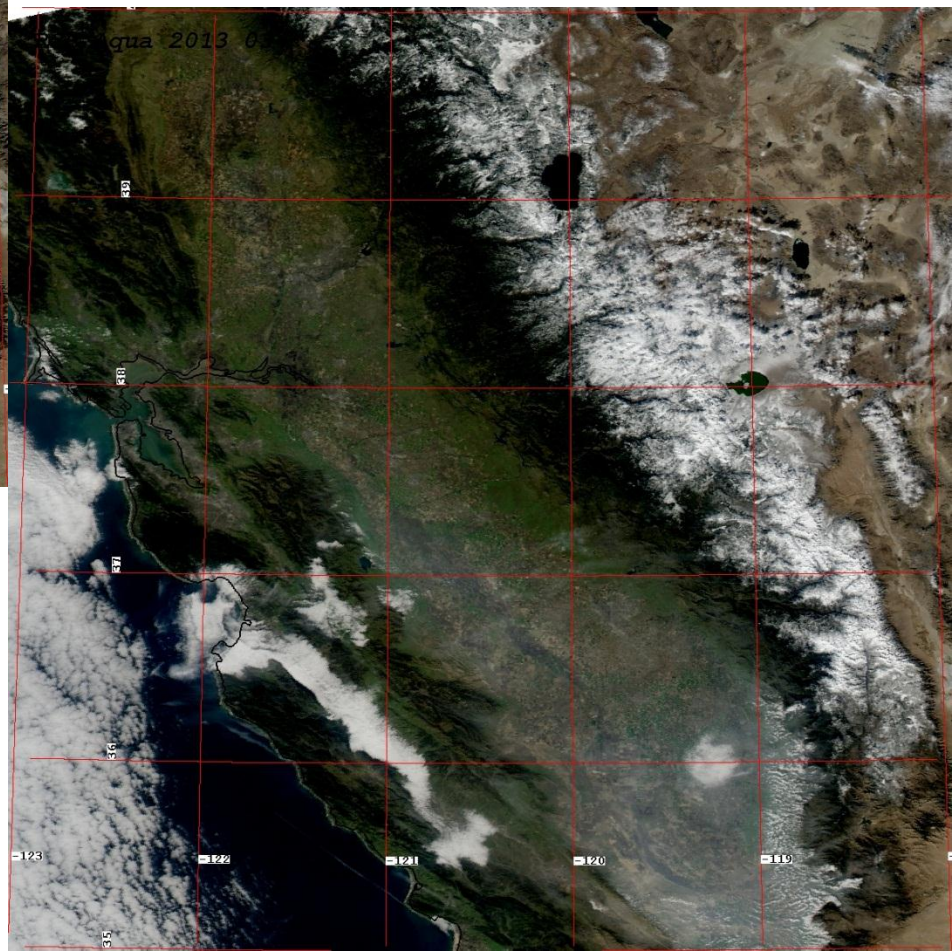
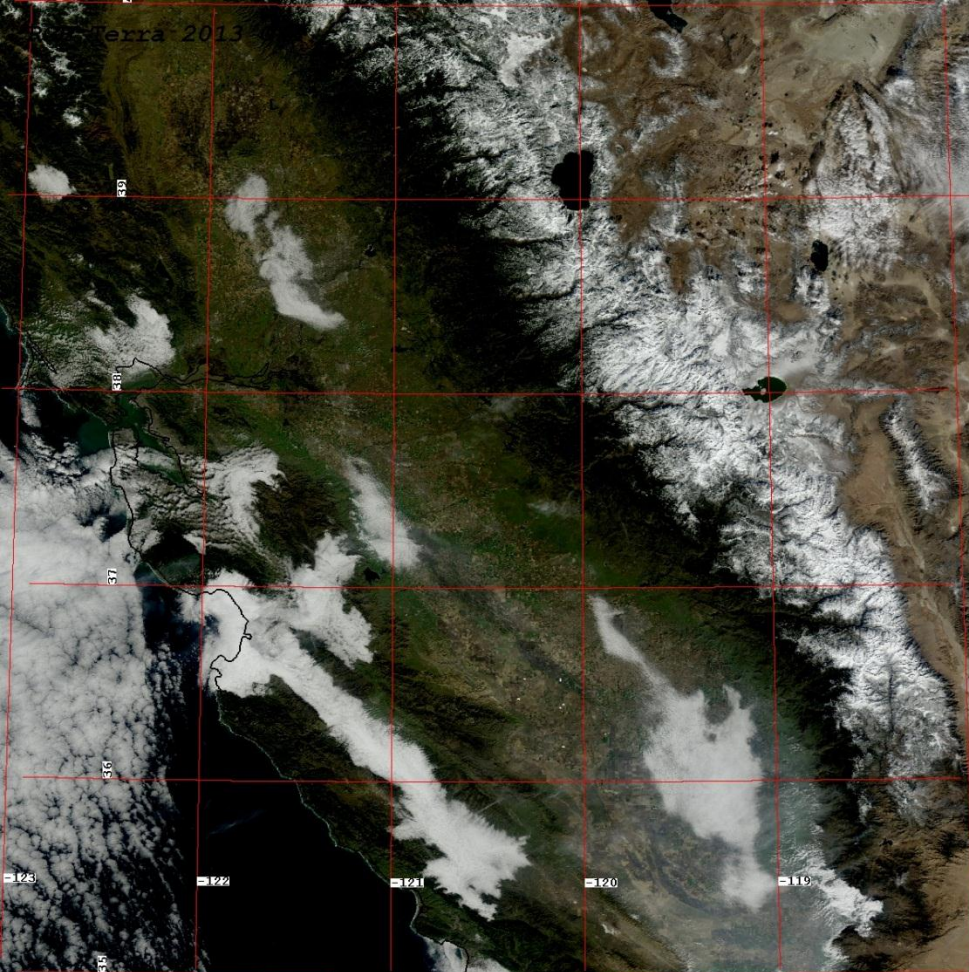
THE FORECAST PATTERN FOR THE MONDAY THROUGH WEDNESDAY TIME FRAME WILL BE DOMINATED BY HIGH PRESSURE BASED ON FORECAST MODEL SOLUTIONS. A WEAK SHORT WAVE **TROUGH** WILL MOVE QUICKLY ACROSS THE PACIFIC NORTHWEST ON TUESDAY HOWEVER JUST SOME **HIGH CLOUDS** WILL AFFECT SENSIBLE WEATHER OVER THE CENTRAL CALIFORNIA INTERIOR. TEMPERATURES WILL BE WARM FOR EARLY FEBRUARY.

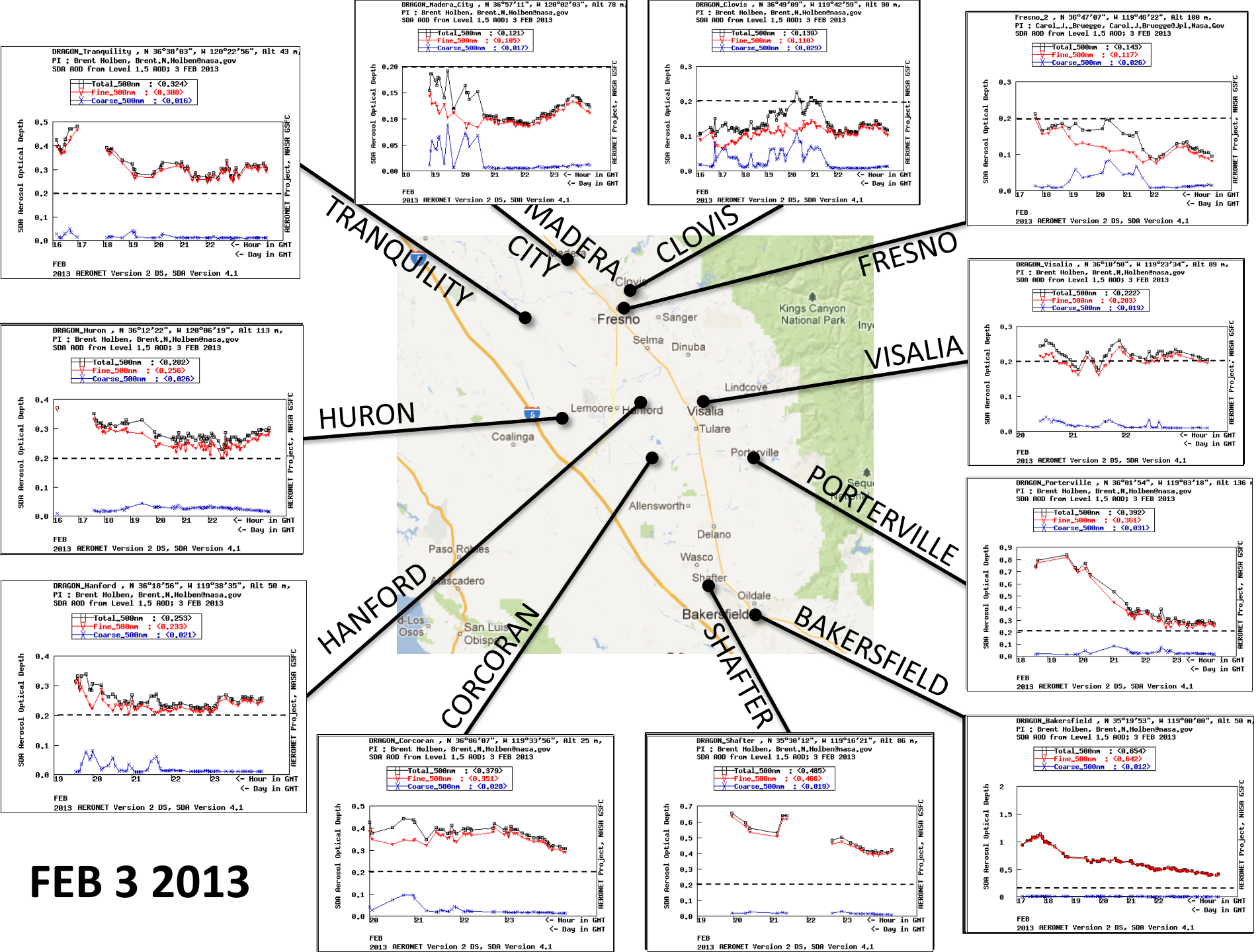
FROM THURSDAY AND FRIDAY THE FORECAST GETS CHALLENGING AND INTERESTING AS FORECAST MODELS BRING A RATHER COLD AND UNSTABLE **LOW PRESSURE SYSTEM** INTO CALIFORNIA. MODEL FORECAST CONFIDENCE IS INCREASING WITH **ECMWF** AND **NCEP ENSEMBLE** SPAGHETTI PLOTS ARE CLUSTERING TOWARDS A DEEP **TROUGH** OVER CENTRAL AND SOUTHERN CALIFORNIA. RMOP **ENSEMBLE MEAN** FORECAST VALUES ALSO SHOW A 70-80% MEASURE OF PREDICTABILITY BOTH THE POSITION AND DEPTH OF THE 500 MB HEIGHT FIELD FOR FRIDAY. WITH LATEST OPERATION RUNS OF THE **ECMWF** AND **GFS** SHOWING A DEEP AND COLD LOW WITH 500 MB TEMPERATURES IN THE -30 TO -35 DEGREE RANGE AND 850 MB TEMPERATURES AS LOW AS -4C OVER CENTRAL CALIFORNIA FRIDAY, A SHOWER, LOWER ELEVATION SNOW SHOWS AND POTENTIAL **THUNDERSTORM** DAY IS ON TAP. **POPS** HAVE BEEN INCREASED TO LIKELY OVER PARTS OF THE AREA, SNOW LEVELS LOWERED AND I WILL INTRODUCE THUNDERSTORMS TO THE GRIDS FOR THE FRIDAY TIME.

MODELS ARE IN GOOD AGREEMENT IN MOVING THE DEEP **TROUGH** AND/OR **CLOSED LOW** EAST FRIDAY NIGHT AND SATURDAY FOR A DRYING TREND.

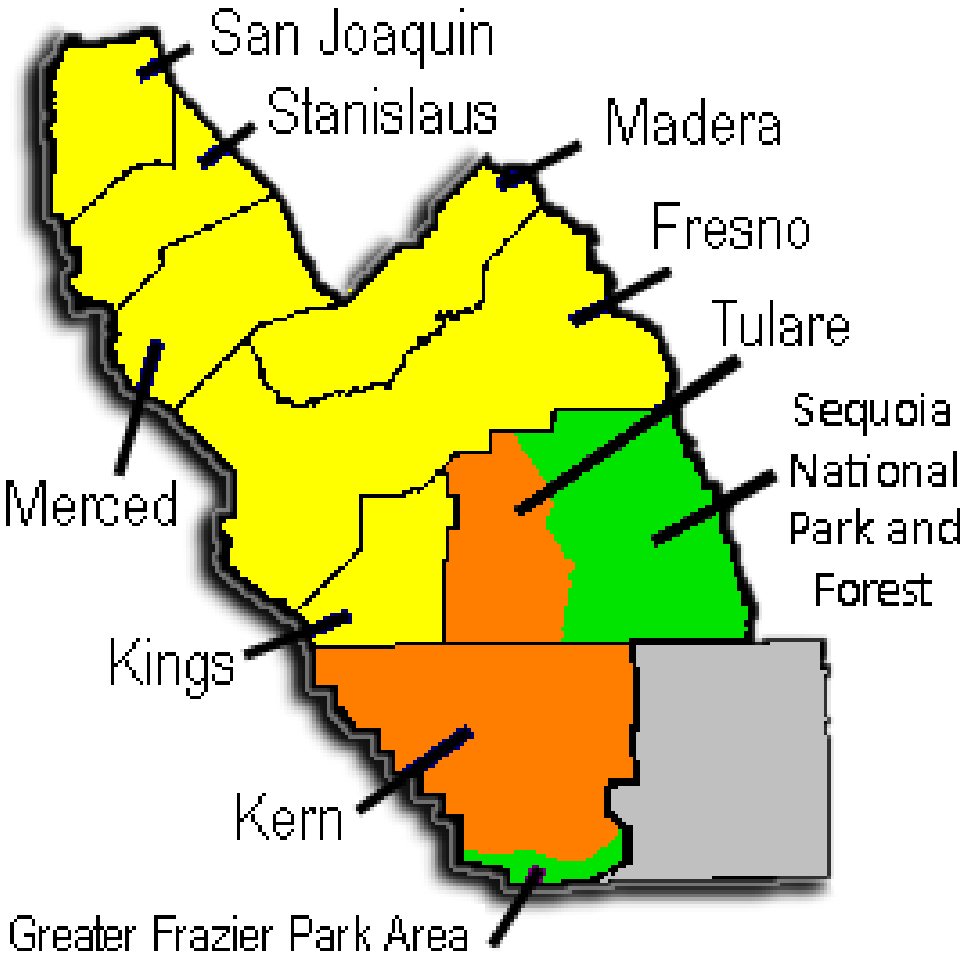
TEMPERATURES WILL BE MUCH COLDER FRIDAY THROUGH THE WEEKEND AND MORNING LOWS WILL NEED TO BE MONITORED FOR THE POTENTIAL OF A SJV FREEZE EVENT SUNDAY AND MONDAY MORNINGS.






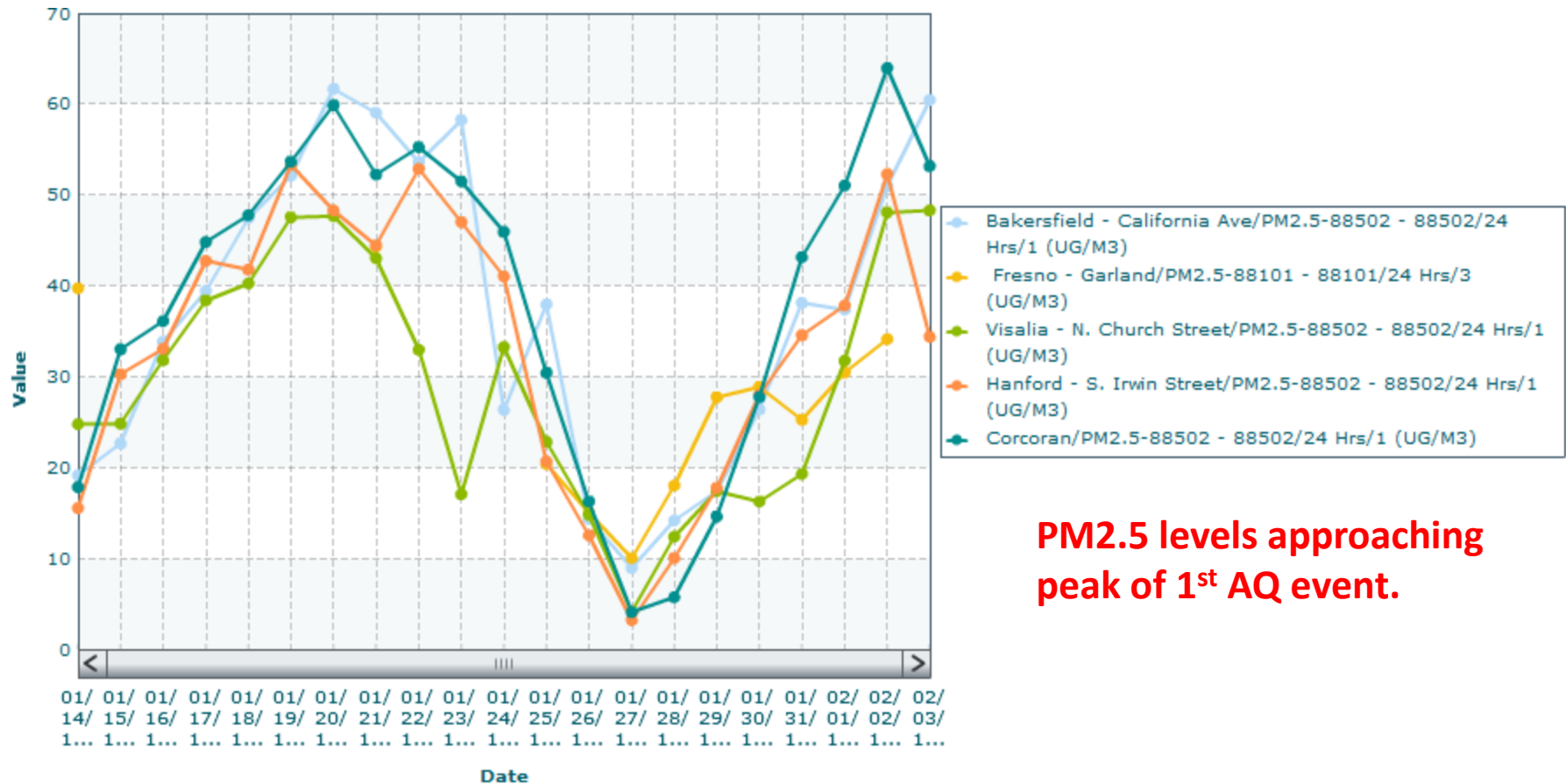


SJV APCD Daily Forecast – for TODAY (February 4)



ROAR LEVEL	Ozone (O ³)	Particulate Matter (PM 2.5)
 LEVEL 1 Good	1-59 ppb	1-15 µg/m ³
 LEVEL 2 Moderate	60-75 ppb	16-35 µg/m ³
 LEVEL 3 Unhealthy for Sensitive Groups	76-95 ppb	36-55 µg/m ³
 LEVEL 4 Unhealthy	96-115 ppb	56-75 µg/m ³
 LEVEL 5 Very Unhealthy	>115 ppb	>75 µg/m ³

DISCOVER-AQ Sites: Daily PM2.5 ($\mu\text{g}/\text{m}^3$)



PM2.5 levels approaching peak of 1st AQ event.

1/14

2/03

DISCOVER-AQ period characterized by two pollution events and one gradual clean-out.

February 3 (Sunday) & February 4 (Today)

Fresno-Garland

Corcoran

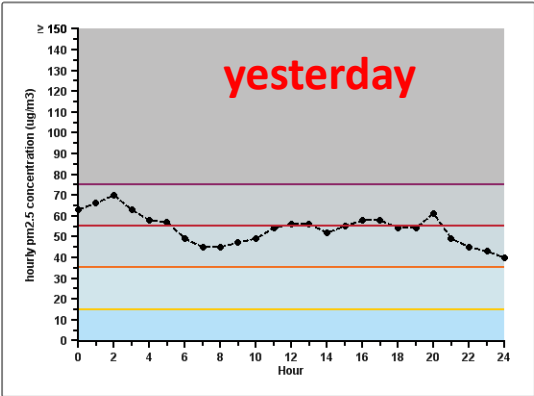
Stopped reporting yesterday
– communication issues.

Reached 88 ug/m³
for 1 hr.

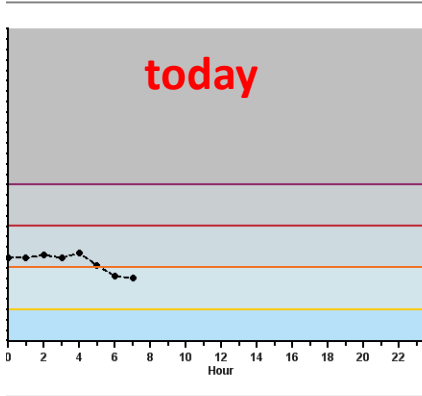
Bakersfield

Stockton

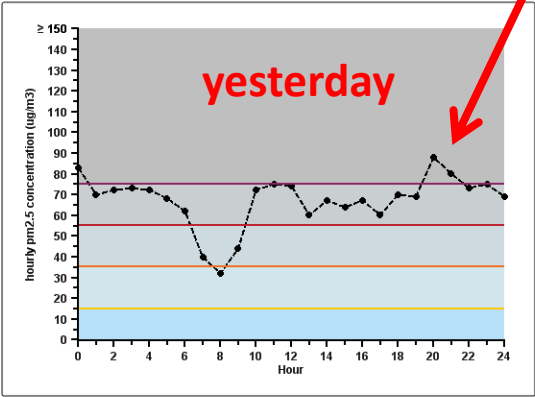
Air District Real-Time Outdoor Activity Risk



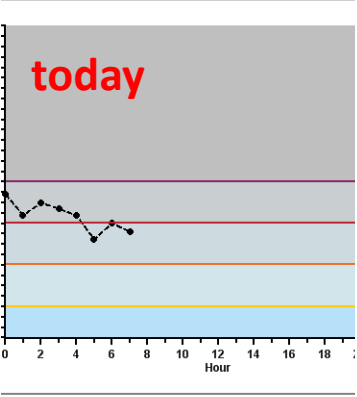
Air District Real-Time Outdoor Activity Risk



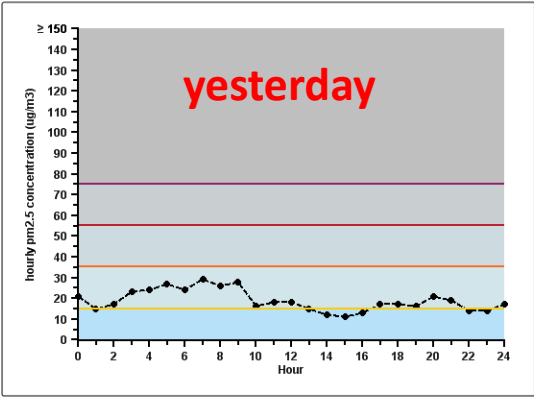
Air District Real-Time Outdoor Activity Risk



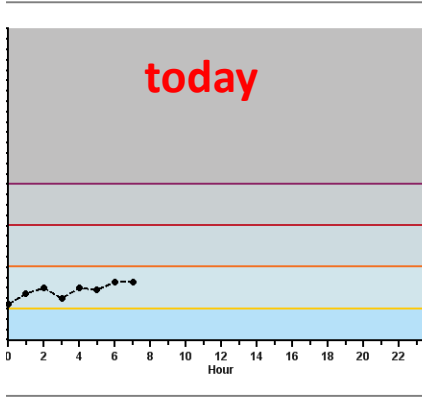
Air District Real-Time Outdoor Activity Risk



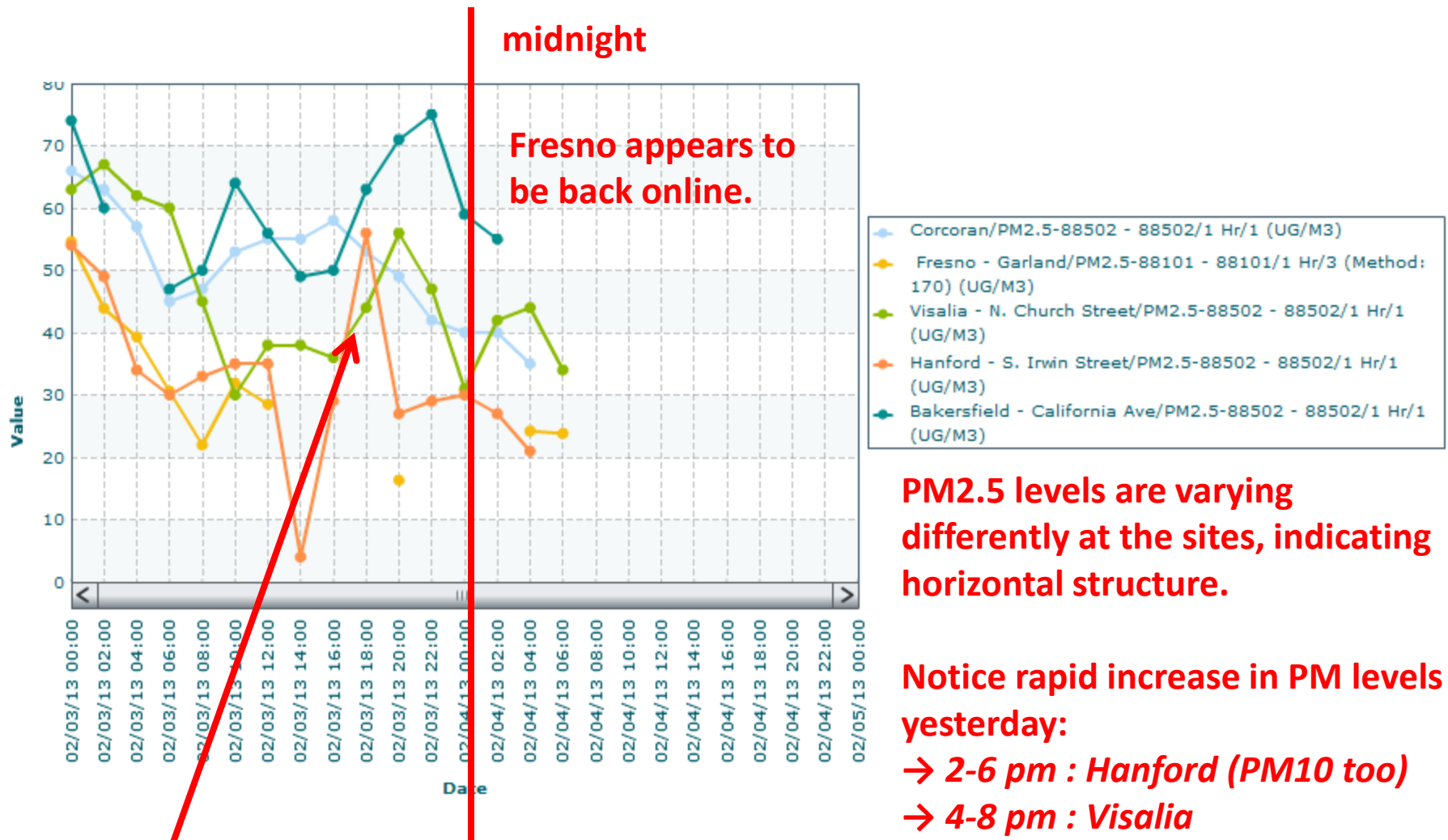
Air District Real-Time Outdoor Activity Risk



Air District Real-Time Outdoor Activity Risk



DISCOVER-AQ Sites: Hourly PM2.5 ($\mu\text{g}/\text{m}^3$)



NW flow with passage of short wave yesterday – the cause???

PM2.5 levels are varying differently at the sites, indicating horizontal structure.

Notice rapid increase in PM levels yesterday:

→ 2-6 pm : Hanford (PM10 too)

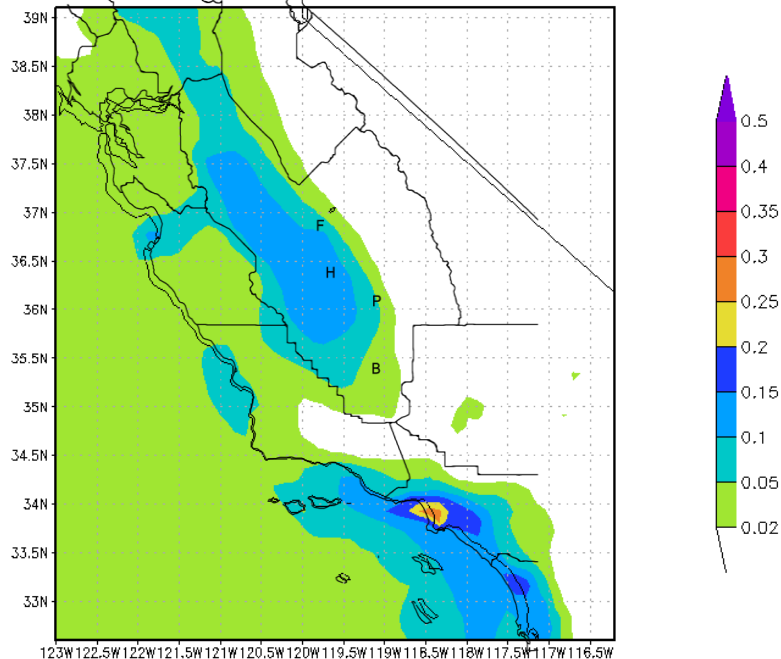
→ 4-8 pm : Visalia

→ 4-10 pm : Bakersfield

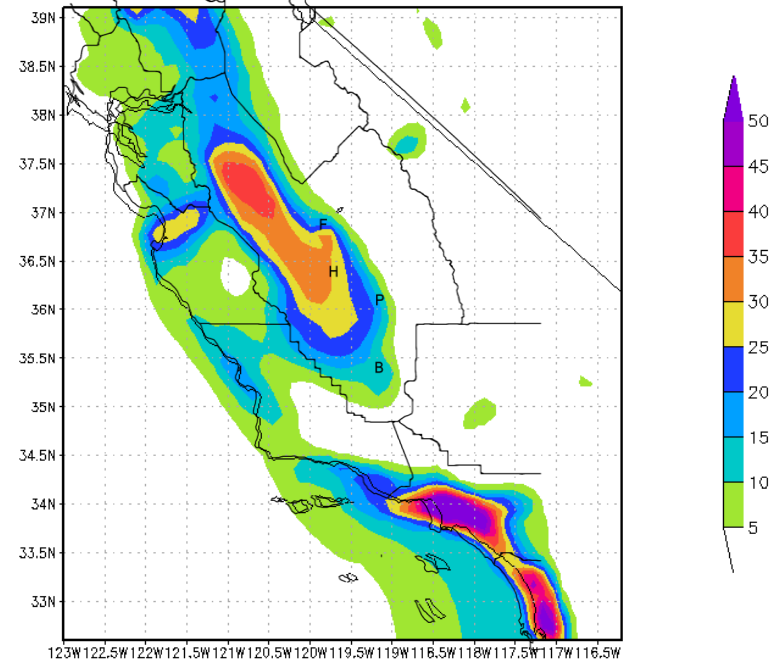
→ BUT, not Corcoran.

NOAA CMAQ: Tuesday 10 am = 18 Z

Column AOD [Dimensionless] at surface Valid 18 FEB 05 201



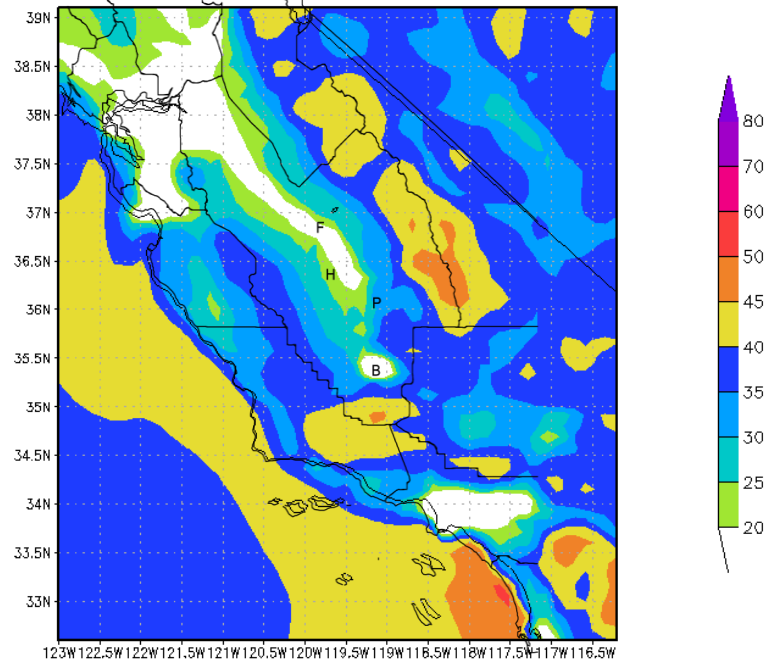
PM25 [$\mu\text{g}/\text{m}^3$] at surface Valid 18 FEB 05 2013



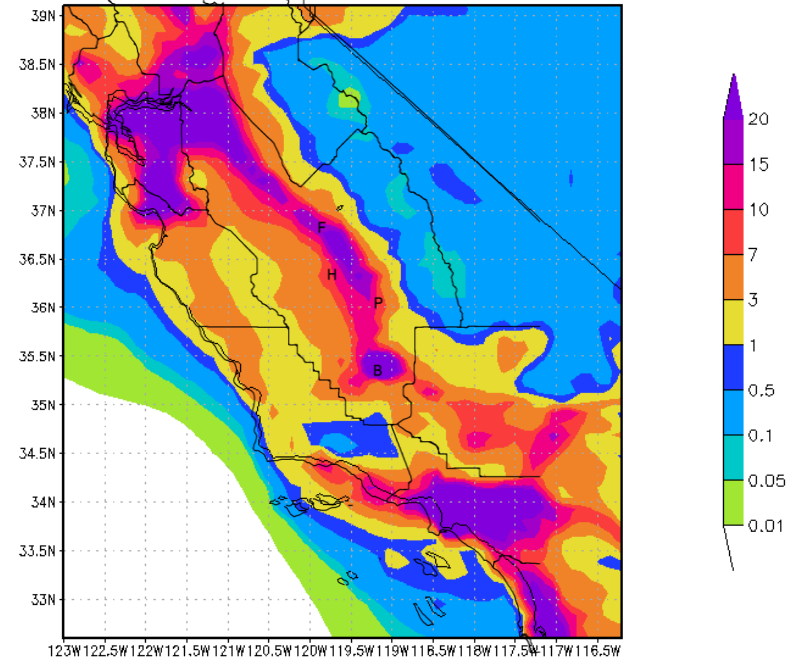
PODEX: Appears to be relatively clean off the LA coast as compared to conditions a week or so ago.

NOAA CMAQ: Tuesday 10 am = 18 Z

O₃ [ppb] at 1013 [hPa] Valid 18 FEB 05 2013

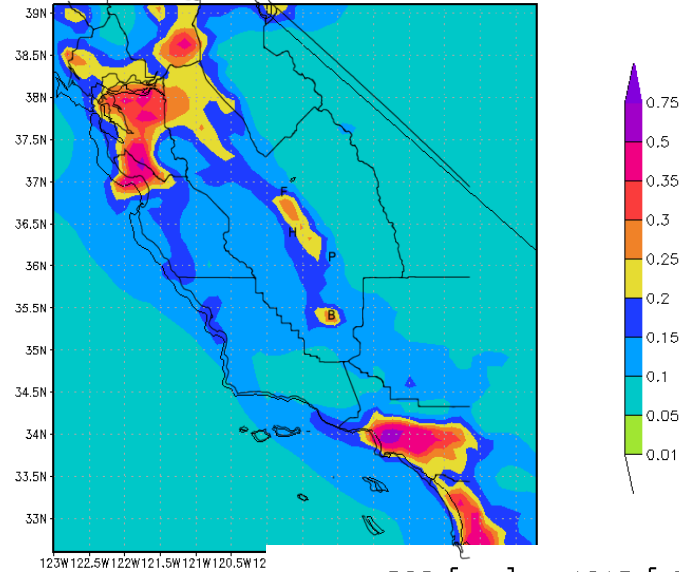


NO₂ [ppb] at 1013 [hPa] Valid 18 FEB 05 2013

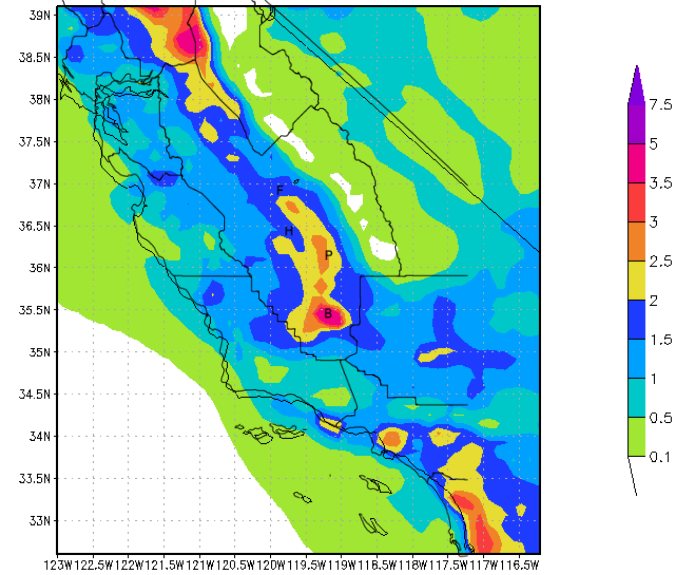


NOAA CMAQ: Tuesday 10 am = 18 Z

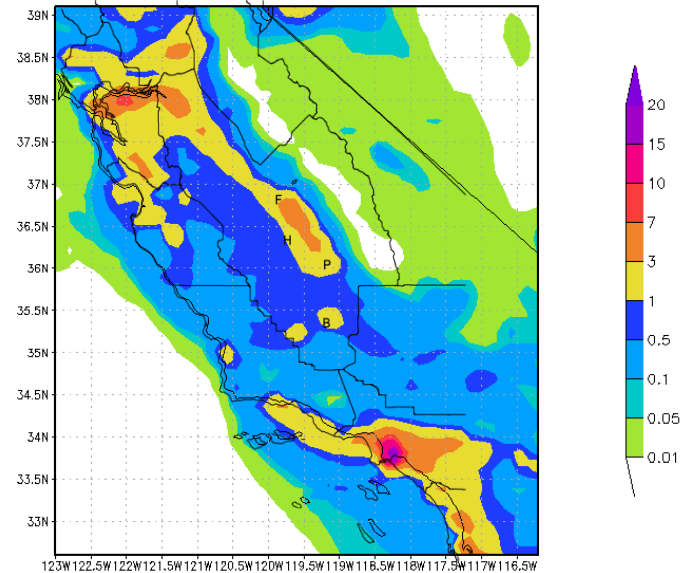
CO [ppm] at 1013 [hPa] Valid 18 FEB 05 2013



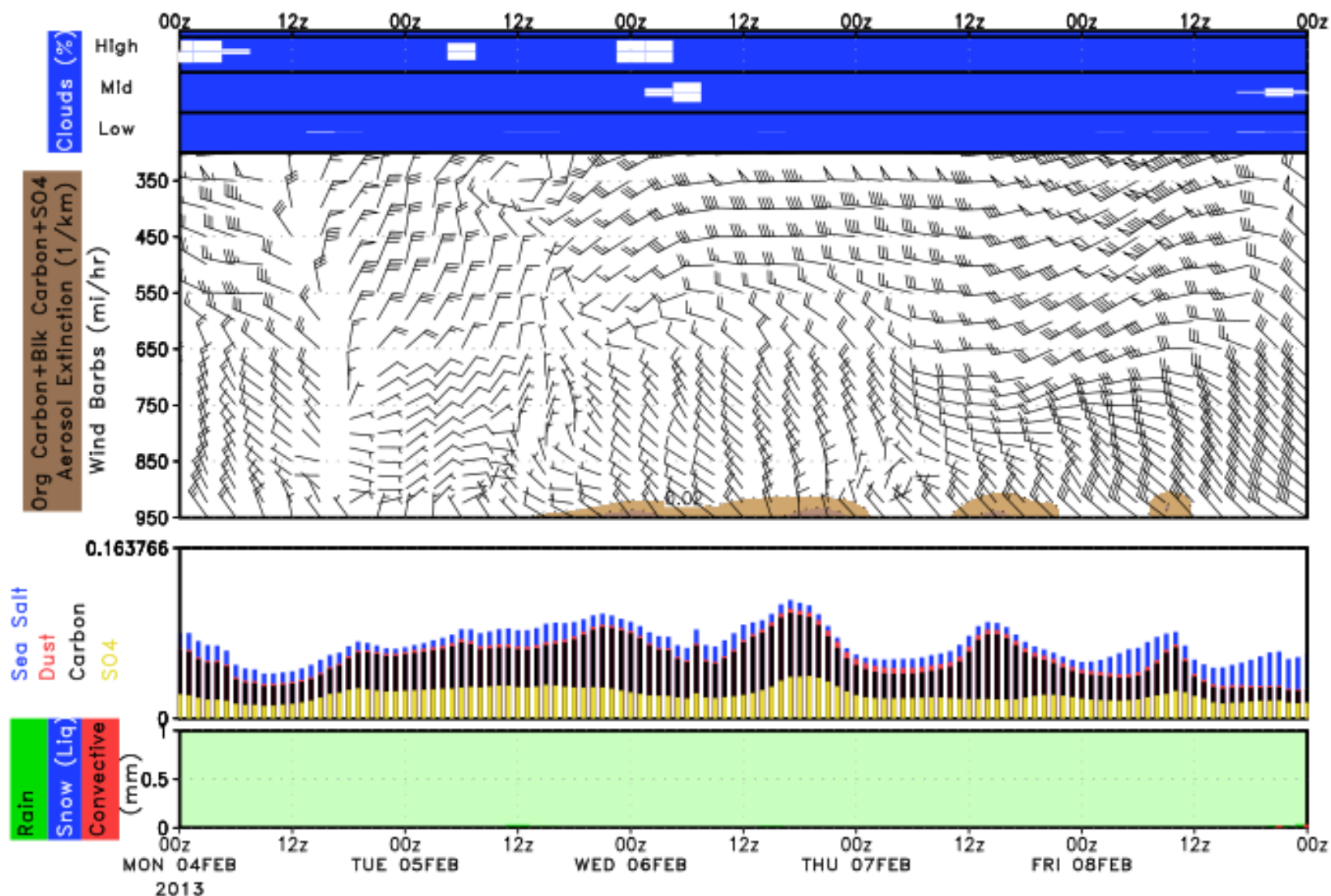
FORM [ppb] at 1013 [hPa] Valid 18 FEB 05 2013



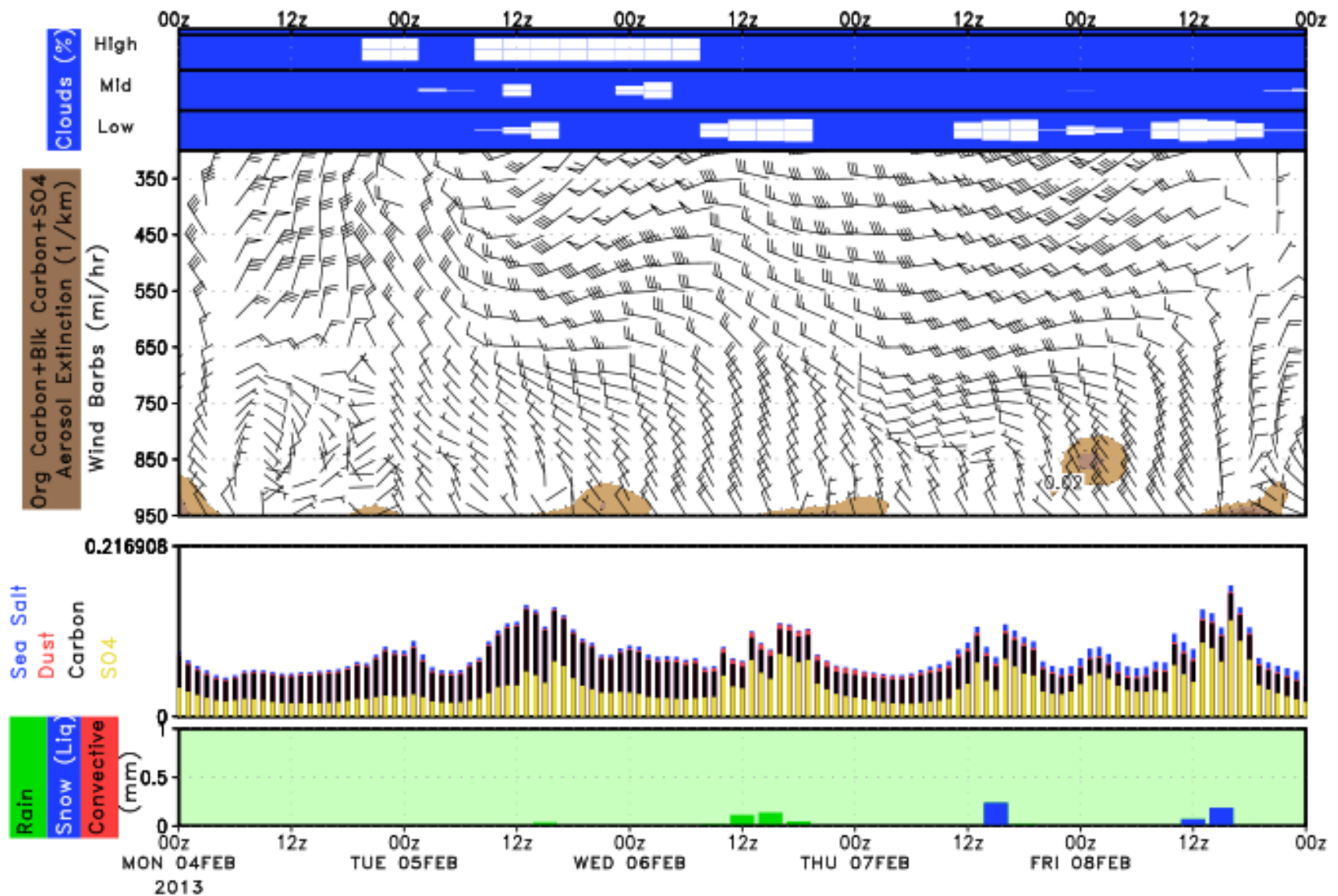
S02 [ppb] at 1013 [hPa] Valid 18 FEB 05 2013



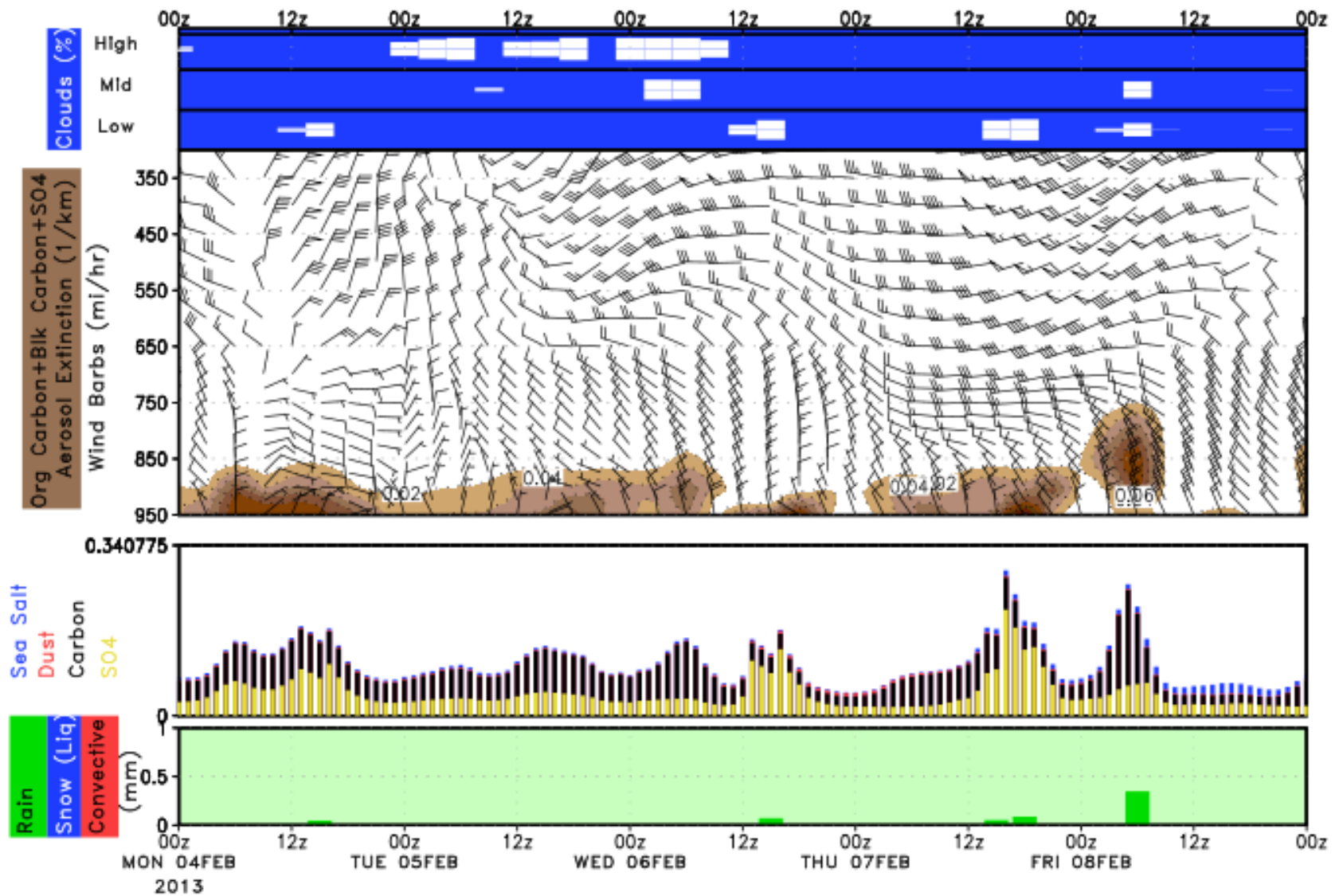
GMAO GEOS5: San Nicolas Is.



GMAO GEOS5: Fresno



GMAO GEOS5: Bakersfield



AQ Summary

NOW: Soupy conditions in the southern SJV.

WEAK DISTURBANCE: The weak disturbance Tuesday night isn't expected to have much impact on PM2.5 levels in SJV – uncertainty though.

AQ CLOCK RESET: Thursday-Friday – SJV flushed out.

IMPACT OF FOG:

The dense fog yesterday and today may “wash out” some PM2.5, but levels should rebound as boundary layer mixing gets going.

There is “structure” to the PM2.5 in the SJV and fog could be contributing.

Recommendations

Tuesday

SJV – SJV forecast to be socked in by cirrus throughout the day. Cirrus should recede Tuesday night. Fog similar to today also forecast to be present during the morning.

PODEX (SF and LA) – Stratus and cirrus clouds remain offshore.

Wednesday

SJV – Region forecast to be cloud-free as a shortwave ridge builds into central CA.

PODEX (SF) – Models forecast a cloud-free pocket extending from SF to LA regions. However, NWS Oxnard forecaster indicated that cirrus will remain, and become a denser layer in the western study region, while marine stratus deck will remain close to the coast. NWS Monterey indicated a pocket clear of stratus and cirrus from 35-36.5N, and extending west.

Recommendations

Thursday until end of week

SJV – A strong trough will move into the region during Thursday, and will be situated over central CA by Friday. This will bring clouds beginning on Thursday, and a good chance of precipitation on Friday. Clouds likely to continue into Saturday.